

2014 Annual Inspection and Radiological Survey Results for the Piqua, Ohio, Decommissioned Reactor Site

Summary

The former Piqua Nuclear Power Facility (PNPF), a decommissioned nuclear power demonstration facility, was inspected on April 16, 2014. The site, located on the east bank of the Great Miami River in Piqua, Ohio, is in good physical condition. There is no requirement for a follow-up inspection.

The site consists of a reactor containment building and an associated auxiliary building that are both used by the City of Piqua as storage space, shops, and offices. The Piqua Underground Utility Department (approximately 10 people) occupies the facility.

Deterioration in the lower portions of the interior of the containment building is unchanged from last year's inspection (e.g. peeling lead-based paint, plaster falling off the walls in some areas, and worn pipe insulation). The cathodic protection system and the high water alarm systems were checked and found to be in good operating condition.

An annual radiological survey was conducted during the annual inspection. Survey results from 106 locations revealed no removable contamination. Only one direct reading exceeded the minimum detectable activity (MDA): the floor drain at the 56 foot level (1,344 dpm/100 cm². Beta activity has been detected in the past at the floor drain. The reading is well below the action level of 5,000 dpm/100 cm².

1.0 Introduction

This report presents the findings of the annual U.S. Department of Energy (DOE) inspection of the Piqua Nuclear Power Facility (PNPF) in Piqua, Ohio. This facility is assigned to the DOE Office of Legacy Management (LM) for long-term custody and care.

M. Miller (Chief Inspector), K. Broberg, (Assistant Inspector), and R. Mowen, (Radiological Technician), all of S.M. Stoller Corporation, the contractor for the DOE Office of Legacy Management, conducted the inspection on April 16, 2014.

Mr. Shane Johnson, Supervisor for the Piqua Underground Utility Department met with inspectors at the start of the inspection. The point of contact for DOE at the facility remains as Mr. Todd Brandenburg, who was unavailable to meet with inspectors on the day of the inspection. A copy of this report will be forwarded to Mr. Brandenburg.

Four employees with the Ohio Department of Health also attended the inspection/survey to gain additional information on the facility; (D. Lipp, T. Walker, S. Helmer, and S. Dettmer).

The purpose of the inspection was to confirm the integrity of the visible features at the facility and to determine if radiological or non-radiological hazards were present.

2.0 Inspection Results

Features discussed in this report are shown on the attached drawings. Photographs to support specific observations are identified in the text and on the drawings by photograph location (PL) numbers.

Exterior

The Containment Building exterior was refurbished around 1995. The exterior of the reactor containment building was in good shape (PL-1).

Surrounding Area

A visual inspection was made of the area surrounding the facility. No changes that could impact the integrity of the facility were observed. It should be noted that in 2012 a new property survey was conducted at the site and a new survey plat of the property boundaries was produced for FIMS purposes.

Interior

Inspectors looked for evidence of structural deterioration and entombment degradation. Concerns noted in previous inspections remain unchanged (i.e., peeling lead based paint, falling plaster, and deteriorating pipe insulation.)

56 foot level: The 56-foot level is the lowest level of the facility. The level is currently empty. The condition of peeling paint on the interior walls of the containment building remains unchanged from the 2013 inspection. Peeling paint (that is falling onto the floors) was analyzed in 2006 and found to contain 0.35 percent lead. The paint will probably continue to peel and fall to the floor. Inspectors are not exposed to unacceptable risk when performing routine inspection activities. Piqua personnel are aware of the presence of the lead-based paint.

A spiral staircase is present in the containment structure (PL-2). Plaster is falling off the walls of the staircase enclosure. This damage has been noted in previous inspection reports (PL-3).

79 foot level: Interior conditions noted in previous inspections (e.g. broken plaster, peeling paint and water damage) are unchanged. In 2013 the City of Piqua cleaned out several of the rooms on this level and they are now being used for storage.

Evidence for water seeping along the ceiling seam of the OAP room remains unchanged from previous inspections (peeling paint and rust stains). This room is located directly above Room B1. Evidence for water seeping from the ceiling seam of Room B-1 also remains unchanged from previous inspections. The southwest wall of both rooms is the curved wall of the containment structure. Both rooms show evidence for water seeping along the same wall of the containment building. The condition is noted on the 79 foot level site inspection map and will continue to be monitored in future inspections.

Fresh moisture was present in the room next to B-1. The fresh moisture was noted on the site inspection map (PL-4). The cause for this moisture is believed to be a crack along the outer wall of the containment structure (PL-5). It is recommended that this crack be filled in to prevent further moisture from seeping into the structure.

100 foot level: During the 2010 inspection, the roof above Room-125 had ponded water and was not properly draining, water was observed on the floor of Room-125, and the outside corner of the room was damaged. Room-125 is accessed off of the loading dock. It is no longer used by Piqua personnel. Piqua personnel repaired the outside corner of the room and corrected the roof drainage problem above the room in 2011. The roof appears to be draining properly and no water was observed on the floor of Room-125 during this year's inspection. The outer corner of the roof appears to be getting worse though (PL-6). Inspectors will continue to watch the outer corner to determine if the deterioration is progressing.

Inspectors noted that the extreme cold of the past winter appears to have had an impact on a platform that is located between the Auxiliary building and the containment structure (PL-7 and PL-8). It is recommended that the platform be examined, and a determination made as to how it is attached to the containment dome structure. If collapse of the platform could damage the wall of the containment dome, it is recommended that the platform be reinforced so that is not allowed to fall down.

Roof Top

Inspectors noted several of the roofing fabric seems are beginning to separate (PL-9). Inspectors also noted that several of the roof drains were partially plugged with material and plant growth (PL-10 and PL-11). Post inspection discussions with Piqua personnel revealed that Piqua is aware of the roof items and will be taking action shortly to address them.

2.1 Cathodic Protection System

A cathodic protection system is installed on the Containment Building to protect the steel shell. The system consists of 10 carbon (graphite) electrodes, buried radially approximately 10 feet to 20 feet from the building foundation, and a rectifier unit that provides DC current. The rectifier unit is mounted in the break room south of and outside the airlock on the 100-foot level. Each carbon electrode is 3 inches in diameter and 60 inches long. The electrodes are connected to the rectifier unit by a header cable; splices are protected in flush-mounted boxes. A structure contact point for monitoring potential can be found on the shell associated with each electrode; some of the contact points also have cables remaining from an abandoned zinc anode protection system. The system also includes reference electrodes and test holes.

Maintenance of the cathodic protection system is specifically addressed in Contract AT(11-1)-1798, dated May 10, 1968, between the U.S. Atomic Energy Commission and the City of Piqua. The City agrees to maintain the system in an operational condition as long as required to preserve the integrity of the entombment until radiological decay renders the contents safe, estimated to be approximately 100 years. Maintenance requirements are not specified but include monthly inspections of the rectifier unit, recording the current and voltage output, and periodic (estimated to be every five years) inspections of the entire system by a qualified service provider. Operating and maintenance costs are borne by the City.

The entire system was checked by a qualified service provider in April 2010, resulting in the replacement of one of the header cables. According to the maintenance log kept with the unit, the system is being checked by plant personnel. The February entry in the log was missing (PL-12).

2.2 High Water Alarm System

An alarm system is installed in the sump on the 56-foot level to detect high water levels before they rise to the bottom of the pressure vessel (PL-13). This system is designed to prevent immersion and accelerated corrosion of the pressure vessel. The alarm triggers when the sump fills to near overflow, alerting personnel to both high water and possible sump pump failure. The alarm registers in the auxiliary building on the Supervisory Control and Data Acquisition system, which is monitored 24 hours a day by an operator. The alarm system is included in the monthly building inspection. The reactor sump alarm test log indicates that the alarm is being tested monthly. The log indicated that the February entry was missing (PL-14). Water was present in the base of the sump during the inspection.

2.3 Radiological Survey

S.M. Stoller staff performed the annual radiological survey on the interior of the reactor containment building, auxiliary building, and exterior areas (PL-15). A total of 106 sample locations were checked for both removable and surface contamination using direct measurements and smears for the detection of alpha and beta-gamma activity. Gamma exposure rates also were measured. Prior to 2008, 111 sample locations were surveyed. Locations 1-5 were removed from the survey in 2008 because the HVAC equipment being sampled was removed.

In 2009, Rooms R-6 and R-7 were modified by the City of Piqua. Modifications included the elimination of a connecting air duct between the two rooms. Smear sample #46 was collected from this air duct prior to 2009. Survey location #46 is now located on the floor of Room R-7 in front of the former air duct.

Table 1 presents information on the instrumentation used to perform the survey. General area gamma exposure rates measured throughout the facility ranged from 4.0 to 11.7 $\mu\text{rem/hr}$. The highest gamma reading was 1.2 $\mu\text{rem/hr}$ > background.

Table 1. Instrumentation for Radiological Survey

Type of Measurement	Radiation	Detector	Meter	Background	Correction Factor	Minimum Detectable Activity
Surface Activity	Alpha	Ludlum 43-89 #5785	Ludlum 2360 #5751	0.0 cpm/100 cm^2	8 alpha	34 dpm/100 cm^2
Surface Activity	Beta	Ludlum 43-89 #5785	Ludlum 2360 #5751	107 cpm/100 cm^2	4 beta	352 dpm/100 cm^2
Exposure Rate	Gamma	N/A	Eberline FH40 GL #016191	10.5 $\mu\text{rem/hr}$	N/A	1 $\mu\text{rem/hr}$
Removable Activity	Alpha	N/A	Ludlum 3030/ #5899	1.0 cpm	Efficiency 42.3%	6.4 dpm/100 cm^2
Removable Activity	Beta	N/A	Ludlum 3030/ #5899	42.0 cpm	Efficiency 33.6%	95.6 dpm/100 cm^2

Key: cpm = counts per minute; dpm = disintegrations per minute; cm^2 = square centimeters; $\mu\text{rem/hr}$ = microrem per hour

Table 2 presents direct surface and removable activity results. Direct surface measurement results indicate the floor drain at the lowest level of the containment building exhibited a direct

beta activity of 1,344 disintegrations per minute per 100 square centimeters (dpm/100 cm²). The smear from this location indicated that no removable activity is present. This result is consistent with previous surveys. All other direct measurements were below the MDA.

No removable contamination was found at any of the 106 sampling points. Attached are the survey maps that indicate the location of each direct measurement and smear sample. The maps also indicate the results of the gamma exposure rate survey conducted at PNPf.

Table 2. Results of the 2014 Radiological Survey at the Piqua, Ohio, Decommissioned Reactor Site

Location/ Building	Elevation ^a	Direct/ Smear #	Direct Reading Activity dpm/100 cm ² Alpha / Beta		Removable Activity dpm/100 cm ² Alpha / Beta		Remarks
Outside	111 ft.	1	NA	NA	NA	NA	HVAC Equip. Removed
Outside	111 ft.	2	NA	NA	NA	NA	HVAC Equip. Removed
Outside	111 ft.	3	NA	NA	NA	NA	HVAC Equip. Removed
Outside	111 ft.	4	NA	NA	NA	NA	HVAC Equip. Removed
Outside	111 ft.	5	NA	NA	NA	NA	HVAC Equip. Removed
Outside	111 ft.	6	<MDA	<MDA	<MDA	<MDA	On concrete platform
Outside	111 ft.	7	<MDA	<MDA	<MDA	<MDA	On concrete platform
Outside	111 ft.	8	<MDA	<MDA	<MDA	<MDA	On concrete platform
Outside	100 ft.	9	<MDA	<MDA	<MDA	<MDA	On concrete platform
Containment	56 ft.	10	<MDA	<MDA	<MDA	<MDA	Floor
Containment	56 ft.	11	<MDA	<MDA	<MDA	<MDA	Floor
Containment	56 ft.	12	<MDA	<MDA	<MDA	<MDA	Floor
Containment	56 ft.	13	<MDA	<MDA	<MDA	<MDA	Floor
Containment	56 ft.	14	<MDA	<MDA	<MDA	<MDA	Floor
Containment	56 ft.	15	<MDA	<MDA	<MDA	<MDA	Floor
Containment	56 ft.	16	<MDA	1,344	<MDA	<MDA	In drain
Containment	56 ft.	17	<MDA	<MDA	<MDA	<MDA	Floor
Containment	56 ft.	18	<MDA	<MDA	<MDA	<MDA	On pedestal
Containment	56 ft.	19	<MDA	<MDA	<MDA	<MDA	On drain
Containment	56 ft.	20	<MDA	<MDA	<MDA	<MDA	On sump grating
Containment	56 ft.	21	<MDA	<MDA	<MDA	<MDA	On vent by stairwell
Containment	56 ft.	22	<MDA	<MDA	<MDA	<MDA	On drain
Containment	56 ft.	23	<MDA	<MDA	<MDA	<MDA	On drain
Containment	79 ft.	24	<MDA	<MDA	<MDA	<MDA	Floor
Containment	79 ft.	25	<MDA	<MDA	<MDA	<MDA	Floor
Containment	79 ft.	26	<MDA	<MDA	<MDA	<MDA	Floor
Containment	79 ft.	27	<MDA	<MDA	<MDA	<MDA	Floor
Containment	83 ft.	28	<MDA	<MDA	<MDA	<MDA	On top of HVAC duct
Containment	83 ft.	29	<MDA	<MDA	<MDA	<MDA	Grating on platform
Containment	83 ft.	30	<MDA	<MDA	<MDA	<MDA	Pipe adjacent to plenum
Containment	83 ft.	31	<MDA	<MDA	<MDA	<MDA	In duct
Containment	83 ft.	32	<MDA	<MDA	<MDA	<MDA	Floor grating
Containment	83 ft.	33	<MDA	<MDA	<MDA	<MDA	Pump pedestal
Containment	83 ft.	34	<MDA	<MDA	<MDA	<MDA	In drain
Containment	83 ft.	35	<MDA	<MDA	<MDA	<MDA	In drain
Containment	83 ft.	36	<MDA	<MDA	<MDA	<MDA	Pump pedestal
Containment	83 ft.	37	<MDA	<MDA	<MDA	<MDA	Stairwell
Containment	100 ft.	38	<MDA	<MDA	<MDA	<MDA	Floor
Containment	100 ft.	39	<MDA	<MDA	<MDA	<MDA	Floor
Containment	100 ft.	40	<MDA	<MDA	<MDA	<MDA	Floor
Containment	100 ft.	41	<MDA	<MDA	<MDA	<MDA	Floor
Containment	100 ft.	42	<MDA	<MDA	<MDA	<MDA	Floor
Containment	100 ft.	43	<MDA	<MDA	<MDA	<MDA	Floor
Containment	100 ft.	44	<MDA	<MDA	<MDA	<MDA	Floor
Containment	100 ft.	45	<MDA	<MDA	<MDA	<MDA	On drain
Containment	100 ft.	46	<MDA	<MDA	<MDA	<MDA	On floor of Room R-7

Table 2 (continued). Results of the 2014 Radiological Survey at the Piqua, Ohio, Decommissioned Reactor Site

Location/ Building	Elevation ^a	Direct/ Smear #	Direct Reading Activity dpm/100 cm ² Alpha / Beta		Removable Activity dpm/100 cm ² Alpha / Beta		Remarks
Containment	111 ft.	47	<MDA	<MDA	<MDA	<MDA	Floor
Containment	111 ft.	48	<MDA	<MDA	<MDA	<MDA	Floor
Containment	111 ft.	49	<MDA	<MDA	<MDA	<MDA	Floor
Containment	100 ft.	50	<MDA	<MDA	<MDA	<MDA	Airlock floor
Aux. Bldg.	79 ft.	51	<MDA	<MDA	<MDA	<MDA	Floor
Aux. Bldg.	79 ft.	52	<MDA	<MDA	<MDA	<MDA	Floor
Aux. Bldg.	79 ft.	53	<MDA	<MDA	<MDA	<MDA	Floor
Aux. Bldg.	79 ft.	54	<MDA	<MDA	<MDA	<MDA	On drain
Aux. Bldg.	79 ft.	55	<MDA	<MDA	<MDA	<MDA	Floor
Aux. Bldg.	79 ft.	56	<MDA	<MDA	<MDA	<MDA	Floor
Aux. Bldg.	79 ft.	57	<MDA	<MDA	<MDA	<MDA	Floor
Aux. Bldg.	79 ft.	58	<MDA	<MDA	<MDA	<MDA	On drain
Aux. Bldg.	79 ft.	59	<MDA	<MDA	<MDA	<MDA	Floor
Aux. Bldg.	79 ft.	60	<MDA	<MDA	<MDA	<MDA	Floor
Aux. Bldg.	79 ft.	61	<MDA	<MDA	<MDA	<MDA	On drain
Aux. Bldg.	79 ft.	62	<MDA	<MDA	<MDA	<MDA	On sump cover
Aux. Bldg.	79 ft.	63	<MDA	<MDA	<MDA	<MDA	Pump
Aux. Bldg.	79 ft.	64	<MDA	<MDA	<MDA	<MDA	Floor under tank
Aux. Bldg.	79 ft.	65	<MDA	<MDA	<MDA	<MDA	Floor
Aux. Bldg.	79 ft.	66	<MDA	<MDA	<MDA	<MDA	Floor
Aux. Bldg.	79 ft.	67	<MDA	<MDA	<MDA	<MDA	Inside HVAC on floor
Aux. Bldg.	79 ft.	68	<MDA	<MDA	<MDA	<MDA	Floor
Aux. Bldg.	89 ft.	69	<MDA	<MDA	<MDA	<MDA	Floor
Aux. Bldg.	121 ft.	70	<MDA	<MDA	<MDA	<MDA	Floor
Aux. Bldg.	121 ft.	71	<MDA	<MDA	<MDA	<MDA	Floor
Aux. Bldg.	121 ft.	72	<MDA	<MDA	<MDA	<MDA	Floor
Aux. Bldg.	121 ft.	73	<MDA	<MDA	<MDA	<MDA	Floor
Aux. Bldg.	121 ft.	74	<MDA	<MDA	<MDA	<MDA	Floor
Aux. Bldg.	121 ft.	75	<MDA	<MDA	<MDA	<MDA	Floor
Aux. Bldg.	111 ft.	76	<MDA	<MDA	<MDA	<MDA	Floor
Aux. Bldg.	111 ft.	77	<MDA	<MDA	<MDA	<MDA	Floor
Aux. Bldg.	111 ft.	78	<MDA	<MDA	<MDA	<MDA	Floor
Aux. Bldg.	111 ft.	79	<MDA	<MDA	<MDA	<MDA	Floor
Aux. Bldg.	111 ft.	80	<MDA	<MDA	<MDA	<MDA	On vent duct
Aux. Bldg.	111 ft.	81	<MDA	<MDA	<MDA	<MDA	Floor
Aux. Bldg.	100 ft.	82	<MDA	<MDA	<MDA	<MDA	Floor
Aux. Bldg.	100 ft.	83	<MDA	<MDA	<MDA	<MDA	Floor
Aux. Bldg.	100 ft.	84	<MDA	<MDA	<MDA	<MDA	Floor
Aux. Bldg.	100 ft.	85	<MDA	<MDA	<MDA	<MDA	Floor
Aux. Bldg.	100 ft.	86	<MDA	<MDA	<MDA	<MDA	On floor drain
Aux. Bldg.	100 ft.	87	<MDA	<MDA	<MDA	<MDA	Floor
Aux. Bldg.	100 ft.	88	<MDA	<MDA	<MDA	<MDA	On floor drain
Aux. Bldg.	100 ft.	89	<MDA	<MDA	<MDA	<MDA	Floor
Aux. Bldg.	100 ft.	90	<MDA	<MDA	<MDA	<MDA	Floor
Aux. Bldg.	100 ft.	91	<MDA	<MDA	<MDA	<MDA	Floor
Aux. Bldg.	100 ft.	92	<MDA	<MDA	<MDA	<MDA	Floor
Aux. Bldg.	100 ft.	93	<MDA	<MDA	<MDA	<MDA	Floor
Aux. Bldg.	100 ft.	94	<MDA	<MDA	<MDA	<MDA	Floor
Aux. Bldg.	100 ft.	95	<MDA	<MDA	<MDA	<MDA	Floor
Aux. Bldg.	100 ft.	96	<MDA	<MDA	<MDA	<MDA	Floor
Aux. Bldg.	100 ft.	97	<MDA	<MDA	<MDA	<MDA	Floor
Aux. Bldg.	100 ft.	98	<MDA	<MDA	<MDA	<MDA	Floor
Aux. Bldg.	100 ft.	99	<MDA	<MDA	<MDA	<MDA	Floor
Aux. Bldg.	100 ft.	100	<MDA	<MDA	<MDA	<MDA	Floor
Aux. Bldg.	100 ft.	101	<MDA	<MDA	<MDA	<MDA	Floor
Aux. Bldg.	100 ft.	102	<MDA	<MDA	<MDA	<MDA	Floor
Aux. Bldg.	100 ft.	103	<MDA	<MDA	<MDA	<MDA	Floor
Containment	56 ft.	104	<MDA	<MDA	<MDA	<MDA	On drain

Table 2 (continued). Results of the 2014 Radiological Survey at the Piqua, Ohio, Decommissioned Reactor Site

Location/ Building	Elevation ^a	Direct/ Smear #	Direct Reading Activity dpm/100 cm ² Alpha / Beta		Removable Activity dpm/100 cm ² Alpha / Beta		Remarks
Containment	100 ft.	105	<MDA	<MDA	<MDA	<MDA	On drain
Outside	100 ft.	106	<MDA	<MDA	<MDA	<MDA	Concrete floor
Outside	100 ft.	107	<MDA	<MDA	<MDA	<MDA	Concrete wall
Outside	100 ft.	108	<MDA	<MDA	<MDA	<MDA	Floor under flange
Outside	100 ft.	109	<MDA	<MDA	<MDA	<MDA	Concrete floor
Outside	100 ft.	110	<MDA	<MDA	<MDA	<MDA	Concrete floor
Containment	79 ft.	111	<MDA	<MDA	<MDA	<MDA	In HVAC duct

^a Elevations are designated as feet above the lowest floor of the original plant.

key: dpm = disintegrations per minute; cm² = centimeters squared; MDA = minimum detectable activity; NA = not applicable or not accessible, < = less than

3.0 Recommendations

- 1) Fresh moisture was noted on the wall, outside of Room B-1 on the 79 foot level. The cause for this moisture is believed to be a crack along the outer wall of the containment structure.

Recommendation: It is recommended that this crack be filled in to prevent further moisture from seeping into the structure.

- 2) Inspectors noted that the extreme cold of the past winter appears to have had an impact on a platform that is located between the Auxiliary building and the containment structure.

Recommendation: It is recommended that the platform be examined, and a determination made as to how it is attached to the containment dome structure. If collapse of the platform could damage the wall of the containment dome, it is recommended that the platform be reinforced so that it is not allowed to fall down.

4.0 Photographs

Photograph Location Number	Azimuth	Elevation	Photograph Description
PL-1	130	Ground Surface	Outside view of containment dome.
PL-2	250	56 foot level	Spiral staircase.
PL-3	250	56 foot level	Wall damage.
PL-4	225	79 foot level	Active water stain.
PL-5	315	Ground Surface	Crack around base of containment dome.
PL-6	215	Ground Surface	Outside corner of room 125.
PL-7	140	Ground Surface	Break platform on northwest side of Auxiliary Building.
PL-8	140	Ground Surface	Break platform on northwest side of Auxiliary Building.
PL-9	NA	Roof	Seams in roof material separating.
PL-10	NA	Roof	Weeds growing around roof drains.
PL-11	180	Roof	Weeds growing around roof drains.
PL-12	NA	100 foot level	Rectifier unit monthly inspection log.
PL-13	NA	56 foot level	Water in base of sump.
PL-14	NA	56 foot level	Sump monthly inspection log.
PL-15	60	79 foot level	Radiation tech taking a reading.



PIQ 4/2014. PL- 1. Outside view of containment dome.



PIQ 4/2014. PL- 2. Spiral staircase.



PIQ 4/2014. PL- 3. Wall damage.



PIQ 4/2014. PL- 4. Active water stain.



PIQ 4/2014. PL- 5. Crack around base of containment dome.



PIQ 4/2014. PL- 6. Outside corner of room 125.



PIQ 4/2014. PL- 7. Break platform on northwest side of Auxiliary Building.



PIQ 4/2014. PL- 8. Break platform on northwest side of Auxiliary Building.



PIQ 4/2014. PL- 9. Seams in roof material separating.



PIQ 4/2014. PL- 10. Weeds growing around roof drains.



PIQ 4/2014. PL- 11. Weeds growing around roof drains.

CATHODIC PROTECTION RECTIFIER MAINTENANCE SHEET					
OLD ATOMIC PLANT - PIQUA, OHIO					
RECTIFIER	D.C. VOLTS	OUTPUT AMPS	DATE	BY	REMARKS
	29	15.5	5/8/13	BB	
	30	16.5	6/3/13	DW	
	30	17.5	7-1-13	DW	
D-1	29	17.5	8/5/13	BB	
D-1	29	17.5	8/30/13	BB	
D-1	29	17.5	10/1/13	BB	
D-1	30	16.5	10/31/13	BB	
D-1	30	15	12/3/13	BB	
D-1	29	16.5	12/30/13	BB	
D-1	29	14.0	3/13/14	CH	
D-1	29	14.1	4/1/14	BB	

PIQ 4/2014. PL- 12. Rectifier unit monthly inspection log.



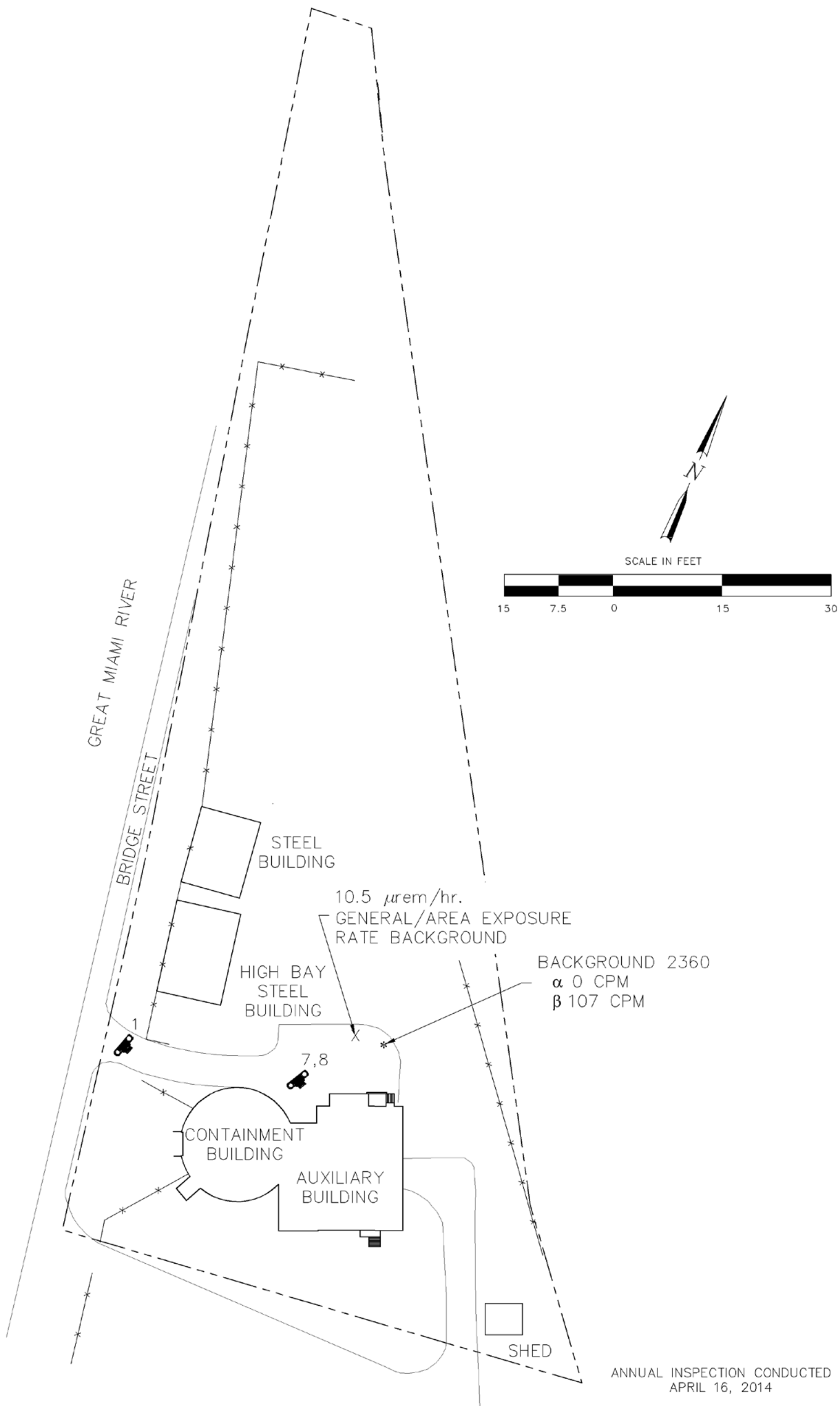
PIQ 4/2014. PL- 13. Water in base of sump.

[illegible]

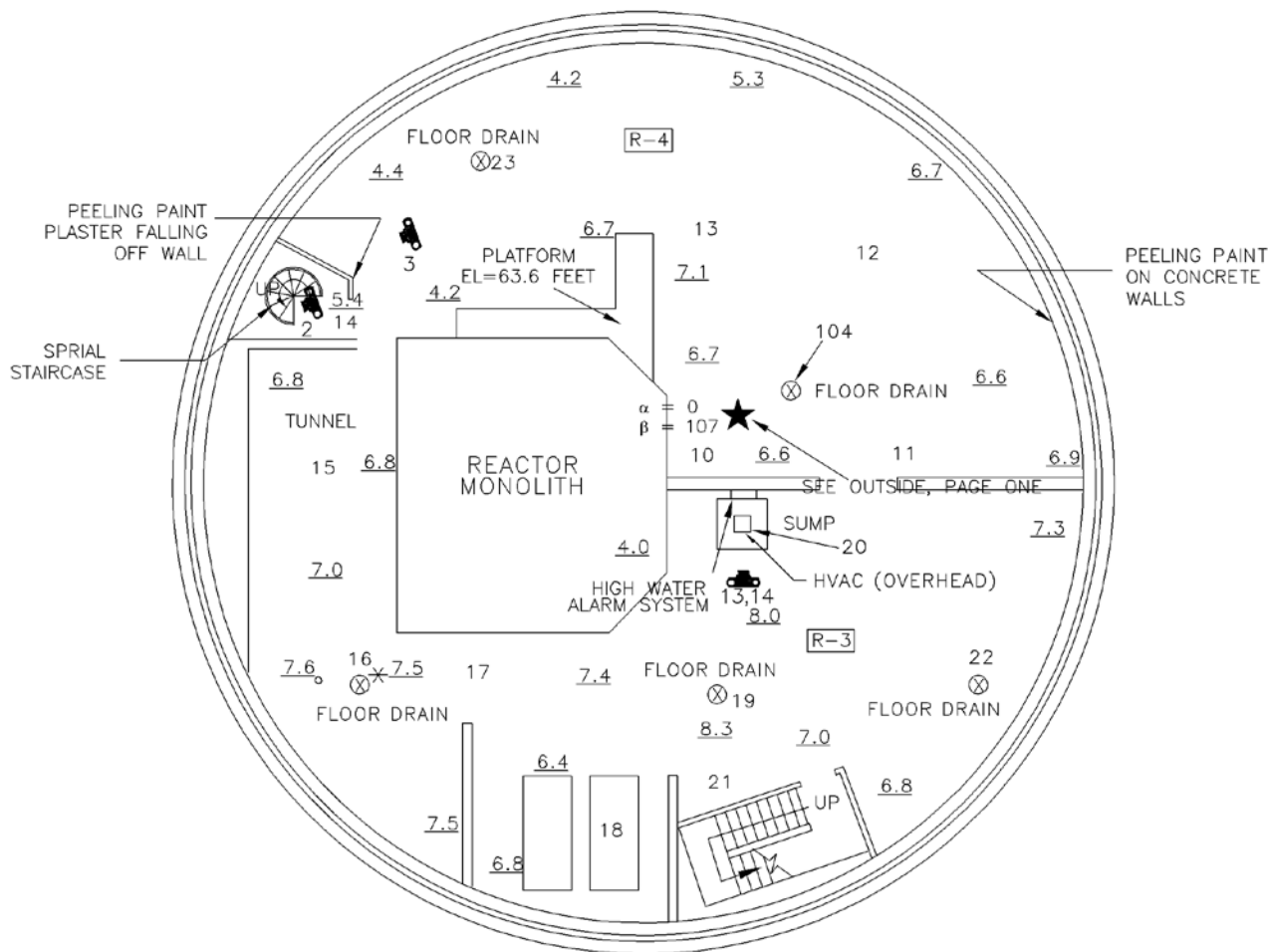
PIQ 4/2014. PL- 14. Sump monthly inspection log.



PIQ 4/2014. PL-15. Radiation tech taking a reading.



U.S. DEPARTMENT OF ENERGY GRAND JUNCTION, COLORADO	Work Performed by S.M. Stoller Corporation Under DOE Contract No. DE-AM01-07LM00060
2014 ANNUAL RADIOLOGICAL SURVEY RESULTS PIQUA DECOMMISSIONED REACTOR SITE PIQUA, OHIO	
DATE PREPARED: JUNE 4, 2014	FILENAME: S1118800



PLAN - 56 FOOT LEVEL

SMEAR/DIRECT LOCATIONS ON THE 56-FOOT LEVEL

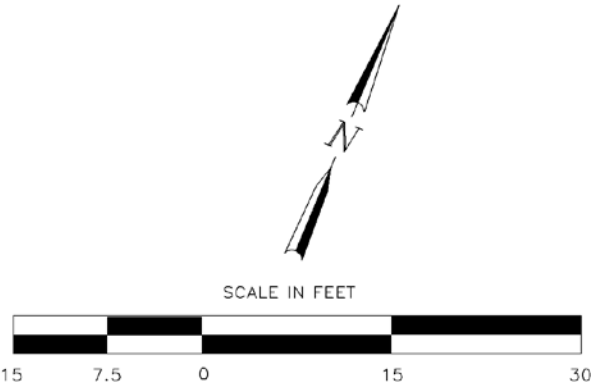
- 10-FLOOR
- 11-FLOOR
- 12-FLOOR
- 13-FLOOR
- 14-FLOOR
- 15-FLOOR
- 16-IN DRAIN
- 17-FLOOR
- 18-ON PEDESTAL
- 19-ON DRAIN
- 20-SUMP GRATING
- 21-ON VENT BY STAIRWELL
- 22-ON DRAIN
- 23-ON DRAIN
- 104-ON DRAIN

INSTRUMENT	LUDLUM 2360	LUDLUM 3030	Eberline FH40G-L
SERIAL #	5751/5785	5899	S016191
CAL. DUE	3-7-15	3-7-2015	3-11-2015
CORRECTION FACTORS	α 8 β 4	α EFF. 42.3% β EFF. 33.6%	N/A
BACKGROUND	α 0 CPM β 107 CPM	α 1.0 CPM β 42.0 CPM	10.5 μ rem/hr
KEY: NO. =GENERAL AREA EXPOSURE RATE (μ rem/hr) *NO. =CONTACT EXPOSURE RATE (μ rem/hr) NO. =SMEAR/DIRECT LOCATION R-4 = ROOM NUMBER		SURVEYED BY: DATE: ROY L. MOWEN 4/16/14 REVIEWED BY: DATE:	

★ = BACKGROUND DETERMINATION LOCATION OUTSIDE
 2360 α = 0 cpm
 β = 107 cpm

1 PHOTO LOCATION, ROTATION, AND NUMBER

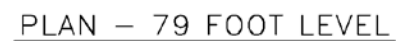
NOTE: ALL 2014 GAMMA READINGS WERE < BKGD ON THIS LEVEL.



ANNUAL INSPECTION CONDUCTED
APRIL 16, 2014

U.S. DEPARTMENT OF ENERGY GRAND JUNCTION, COLORADO	Work Performed by S.M. Stoller Corporation Under DOE Contract No. DE-AM01-07LM00060
2014 ANNUAL RADIOLOGICAL SURVEY RESULTS PIQUA DECOMMISSIONED REACTOR SITE PIQUA, OHIO	
DATE PREPARED: JUNE 4, 2014	FILENAME: S1118800

24-FLOOR
25-FLOOR
26-FLOOR
27-FLOOR
111-IN HVAC DUCT
74-FOOT LEVEL

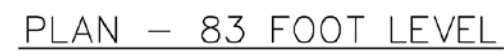


51-FLOOR
52-FLOOR
53-FLOOR
54-ON DRAIN
55-FLOOR
56-FLOOR
57-FLOOR
58-ON DRAIN
59-FLOOR
60-FLOOR
61-ON DRAIN
62-ON SUMP COVER
63-PUMP
64-FLOOR UNDER TANK
65-FLOOR
66-FLOOR
67-INSIDE HVAC ON FLOOR
68-FLOOR
69-FLOOR-89' LEVEL OAP ROOM

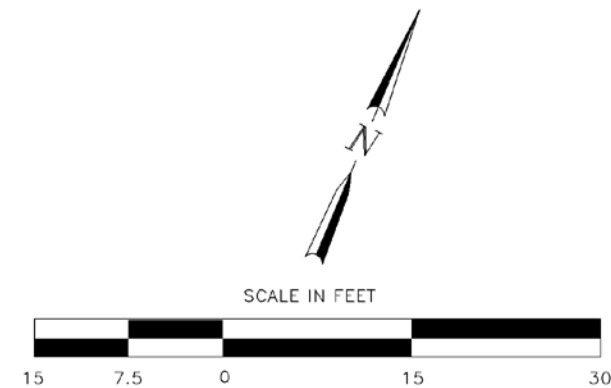
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28-ON TOP OF HVAC UNIT
29-GRATING ON PLAT FORM
30-PIPE ADJACENT TO PLENUM
31-IN DUCT
32-FLOOR GRATING
33-PUMP PEDESTAL
34-IN DRAIN
35-IN DRAIN
36-PUMP PEDESTAL
37-STAIRWELL



NOTE: ALL 2014 GAMMA READINGS
WERE < BKGD. ON THIS LEVEL



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SMEAR/DIRECT LOCATIONS ON THE
100-FOOT LEVEL IN CONTAINMENT STRUCTURE

38-FLOOR
39-FLOOR
40-FLOOR
41-FLOOR
42-FLOOR
43-FLOOR
44-FLOOR
45-ON DRAIN
46-ON DRAIN
50-AIRLOCK FLOOR
105-ON DRAIN

SMEAR/DIRECT LOCATIONS OUTSIDE

106-CONCRETE FLOOR
107-CONCRETE WALL
108-FLOOR UNDER FLANGE
109-CONCRETE FLOOR
110-CONCRETE FLOOR

ROOMS R-6 AND R-7 WERE REMODELED
IN 2009. WALLS WERE PAINTED, SHELVES
ADDED, AND THE AIR DUCT BETWEEN THE
TWO ROOMS WAS REMOVED.

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BACKGROUND	α 0 CPM β 107 CPM	α 1.0 CPM β 42.0 CPM	10.5 μ rem/hr
KEY: NO. = GENERAL AREA EXPOSURE RATE NO. = CONTACT EXPOSURE RATE (μ rem/hr) NO. = SMEAR/DIRECT LOCATION R-4 = ROOM NUMBER		SURVEYED BY: ROY L. MOWEN	DATE: 4/16/14
		REVIEWED BY:	DATE:

HIGHEST GAMMA READING ON THIS LEVEL
WAS 0.7 μ rem/hr ABOVE BKGD IN HALLWAY
OUTSIDE OF ROOM 99.

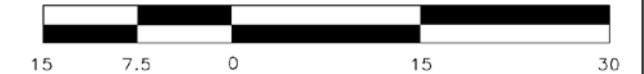
NEW EPOXY FLOORS INSTALLED IN ROOMS
115 AND 121-A IN 2009.

NEW A/C UNIT INSTALLED IN ROOM 121-A IN 2009.

EXPLANATION

- GRAPHITE ANODES
- 1 PHOTO LOCATION, ROTATION, AND NUMBER

SCALE IN FEET



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SMEAR/DIRECT LOCATIONS ON THE
100-FOOT LEVEL IN AUX. BLDG.

82-FLOOR
83-FLOOR
84-FLOOR
85-FLOOR
86-ON FLOOR DRAIN
87-FLOOR
88-ON FLOOR DRAIN
89-FLOOR
90-FLOOR
91-FLOOR
92-FLOOR
93-FLOOR
94-FLOOR
95-FLOOR
96-FLOOR
97-FLOOR
98-FLOOR
99-FLOOR
100-FLOOR
101-FLOOR
102-FLOOR
103-FLOOR

PLAN - 100 FOOT LEVEL

SMEAR/DIRECT LOCATIONS ON THE
111-FOOT LEVEL IN CONTAINMENT STRUCTURE

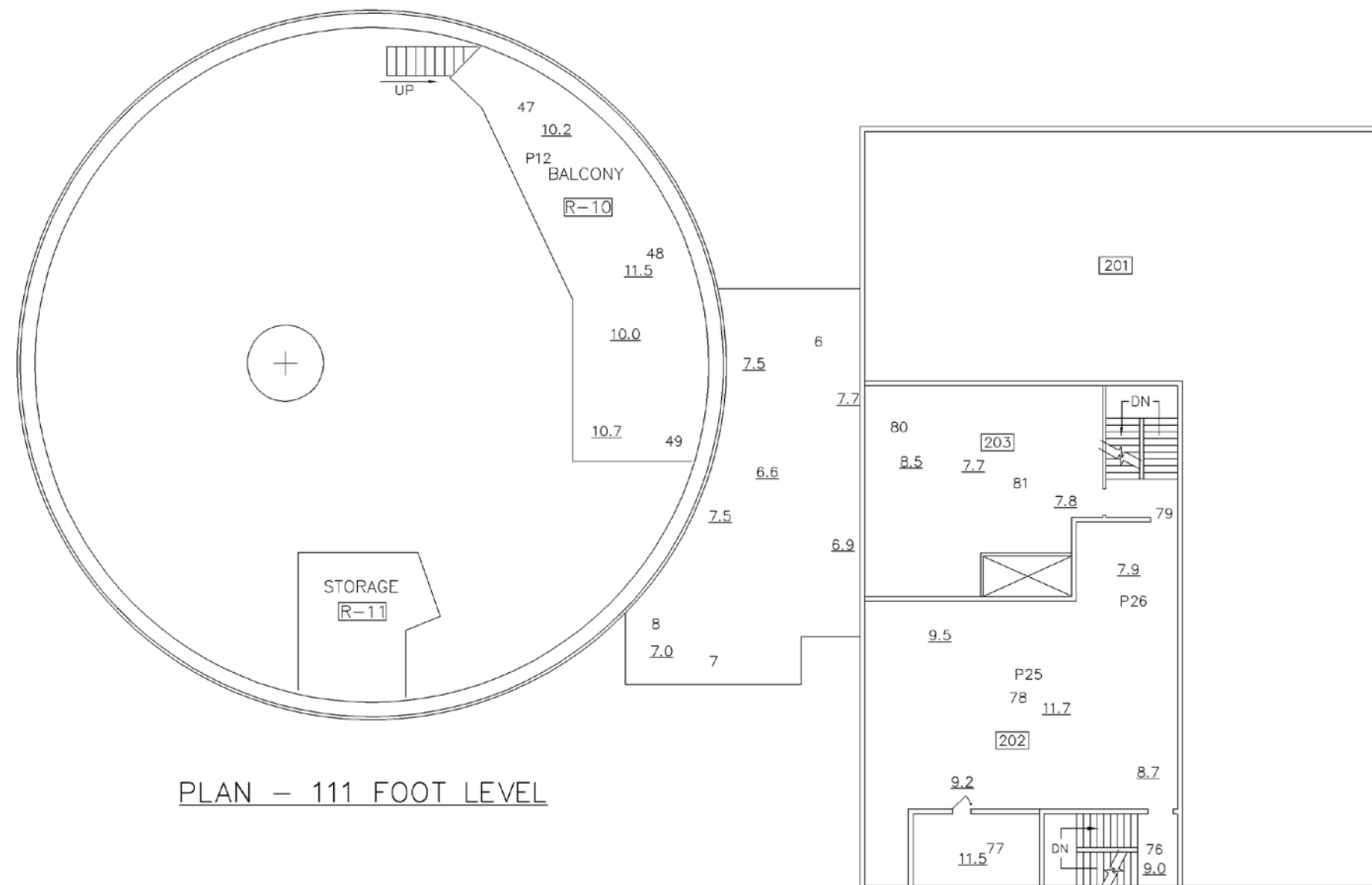
47-FLOOR
48-FLOOR
49-FLOOR

SMEAR/DIRECT LOCATIONS ON THE
111-FOOT LEVEL IN THE AUX. BLDG.

76-FLOOR
77-FLOOR
78-FLOOR
79-FLOOR
80-ON VENT DUCT
81-FLOOR

SMEAR/DIRECT LOCATIONS ON THE
OUTSIDE ON ROOF

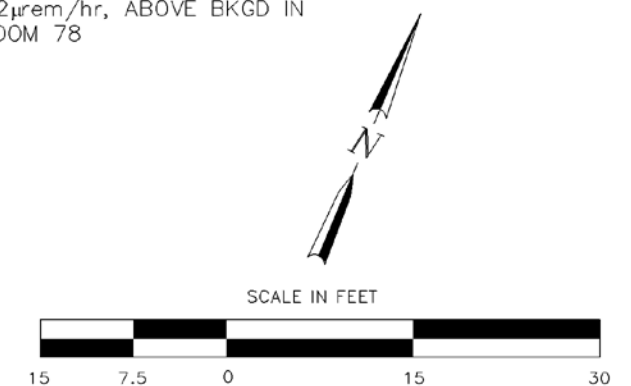
6-ON CONCRETE PLATFORM
7-ON CONCRETE PLATFORM
8-ON CONCRETE PLATFORM



INSTRUMENT	LUDLUM 2360	LUDLUM 3030	Eberline FH40G-L
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CORRECTION FACTORS	α 8 β 4	α EFF. 42.3% β EFF. 33.6%	N/A
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KEY: NO. =GENERAL AREA EXPOSURE RATE (μ rem/hr) X NO. =CONTACT EXPOSURE RATE (μ rem/hr) NO. =SMEAR/DIRECT LOCATION R-4 = ROOM NUMBER		SURVEYED BY: ROY L. MOWEN	DATE: 4/16/14
		REVIEWED BY:	DATE:

NOTE: SAMPLES 1-5 WERE DELETED
BECAUSE HVAC EQUIPMENT HAS BEEN
REMOVED FROM THE ROOF.

HIGHEST GAMMA CONTACT
READING ON THIS LEVEL WAS
1.2 μ rem/hr, ABOVE BKGD IN
ROOM 78

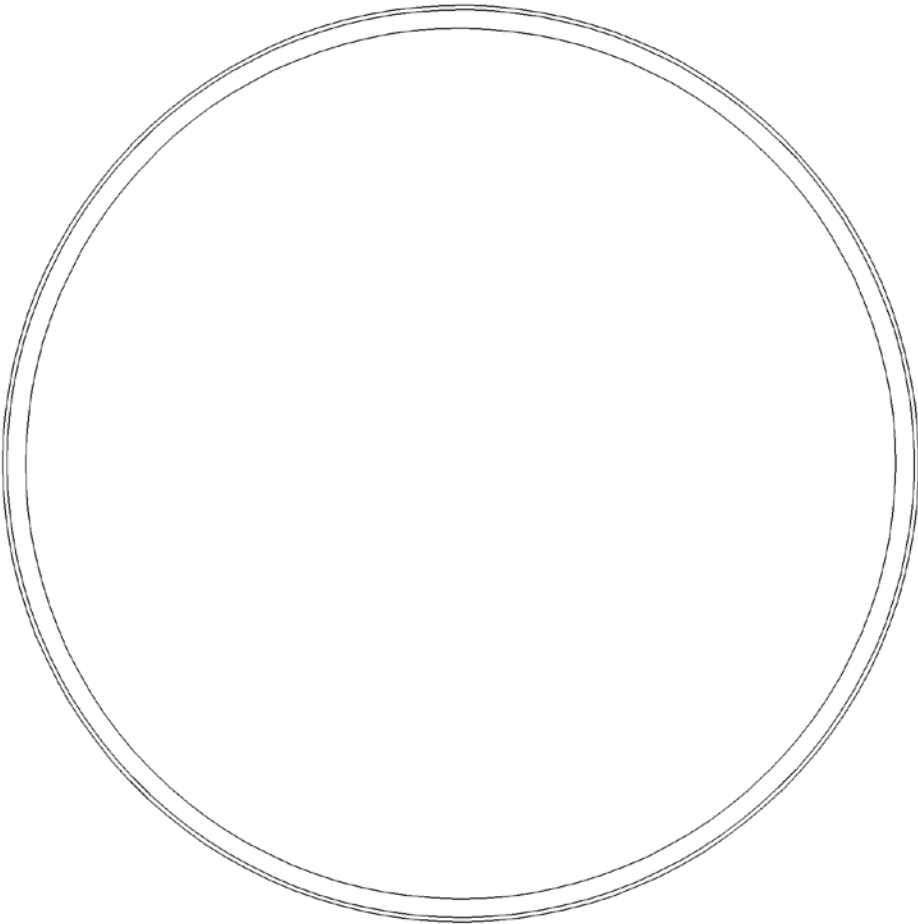


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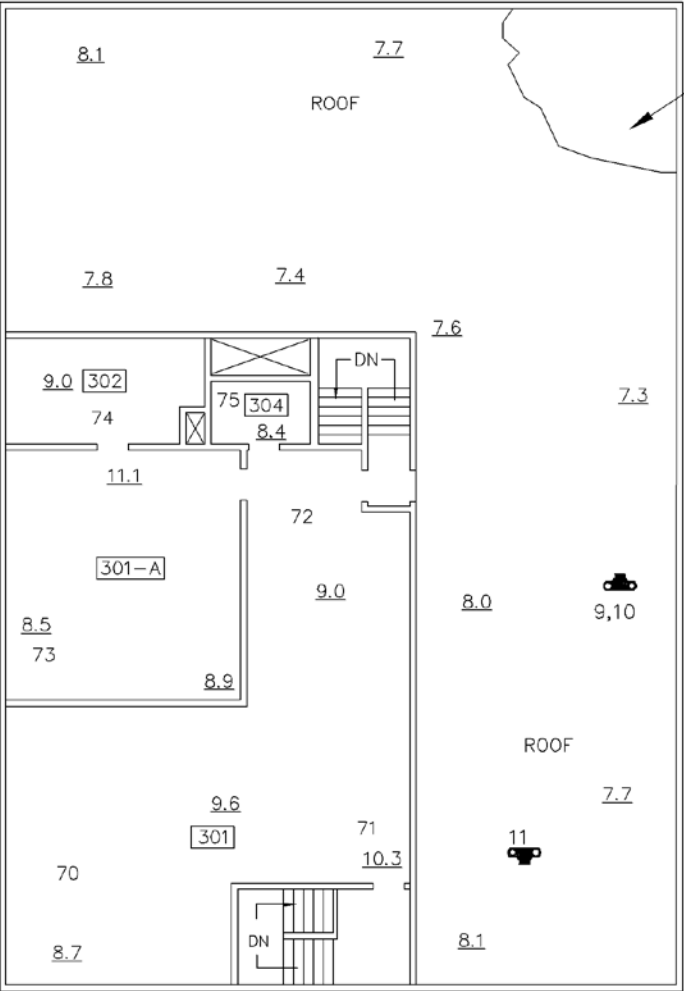
SMEAR/DIRECT LOCATIONS ON THE
121-FOOT LEVEL IN THE AUX. BLDG.

70-FLOOR
71-FLOOR
72-FLOOR
73-FLOOR
74-FLOOR
75-FLOOR



PLAN - 121 FOOT LEVEL

INSTRUMENT	LUDLUM 2360	LUDLUM 3030	Eberline FH40G-L
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CORRECTION FACTORS	α 8 β 4	α EFF. 42.3% β EFF. 33.6%	N/A
BACKGROUND	α 0 CPM β 107 CPM	α 1.0 CPM β 42.0 CPM	10.5 $\mu\text{rem/hr}$
KEY: <u>NO.</u> = GENERAL AREA EXPOSURE RATE ($\mu\text{rem/hr}$) X <u>NO.</u> = CONTACT EXPOSURE RATE ($\mu\text{rem/hr}$) NO. = SMEAR/DIRECT LOCATION R-4 = ROOM NUMBER		SURVEYED BY: ROY L. MOWEN	DATE: 4/16/14
		REVIEWED BY:	DATE:



PONDED WATER ON ROOF

NOTE: ALL 2014 GAMMA READINGS
WERE \leq BKGD ON THIS LEVEL.

PHOTO LOCATION, ROTATION, AND NUMBER



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