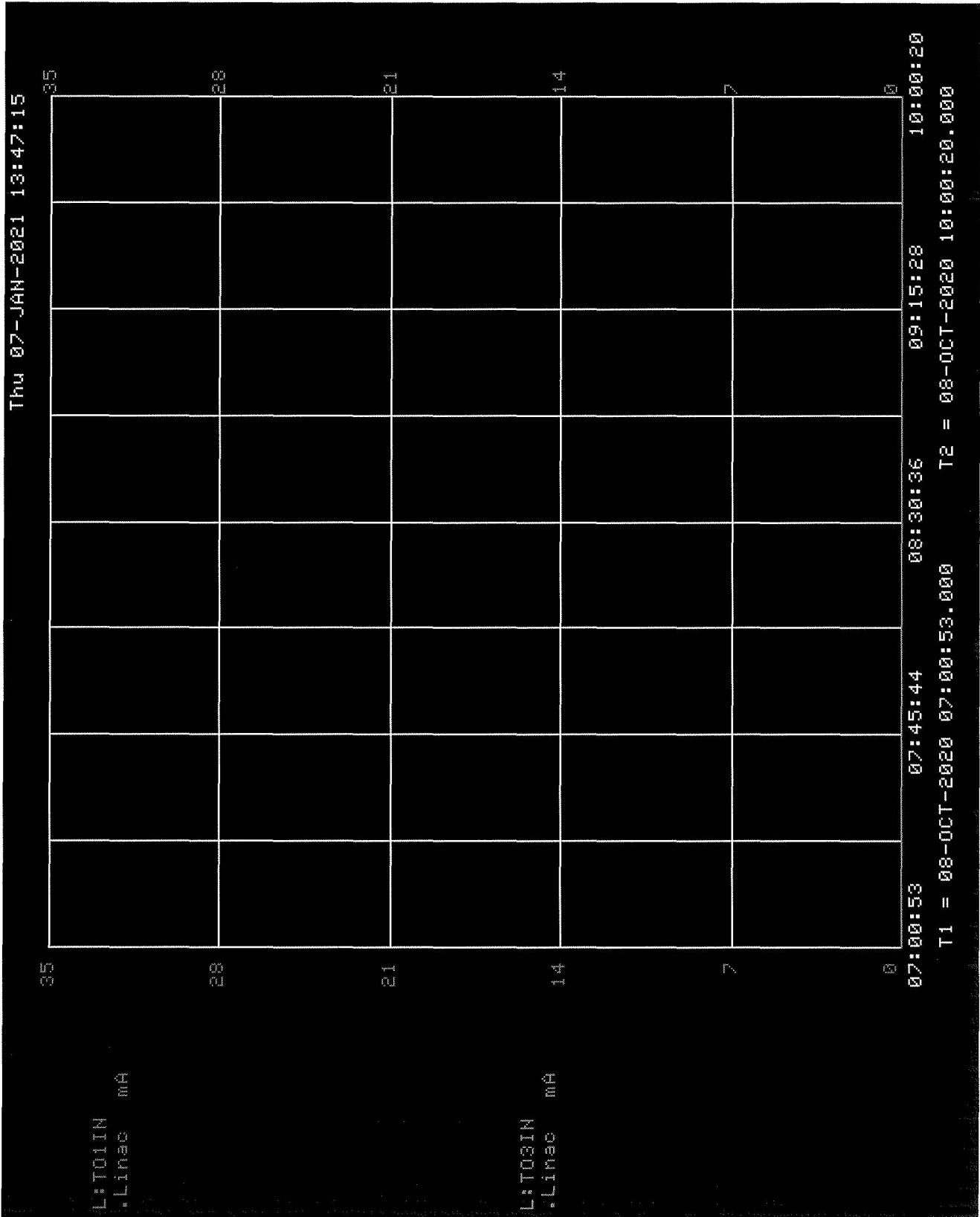


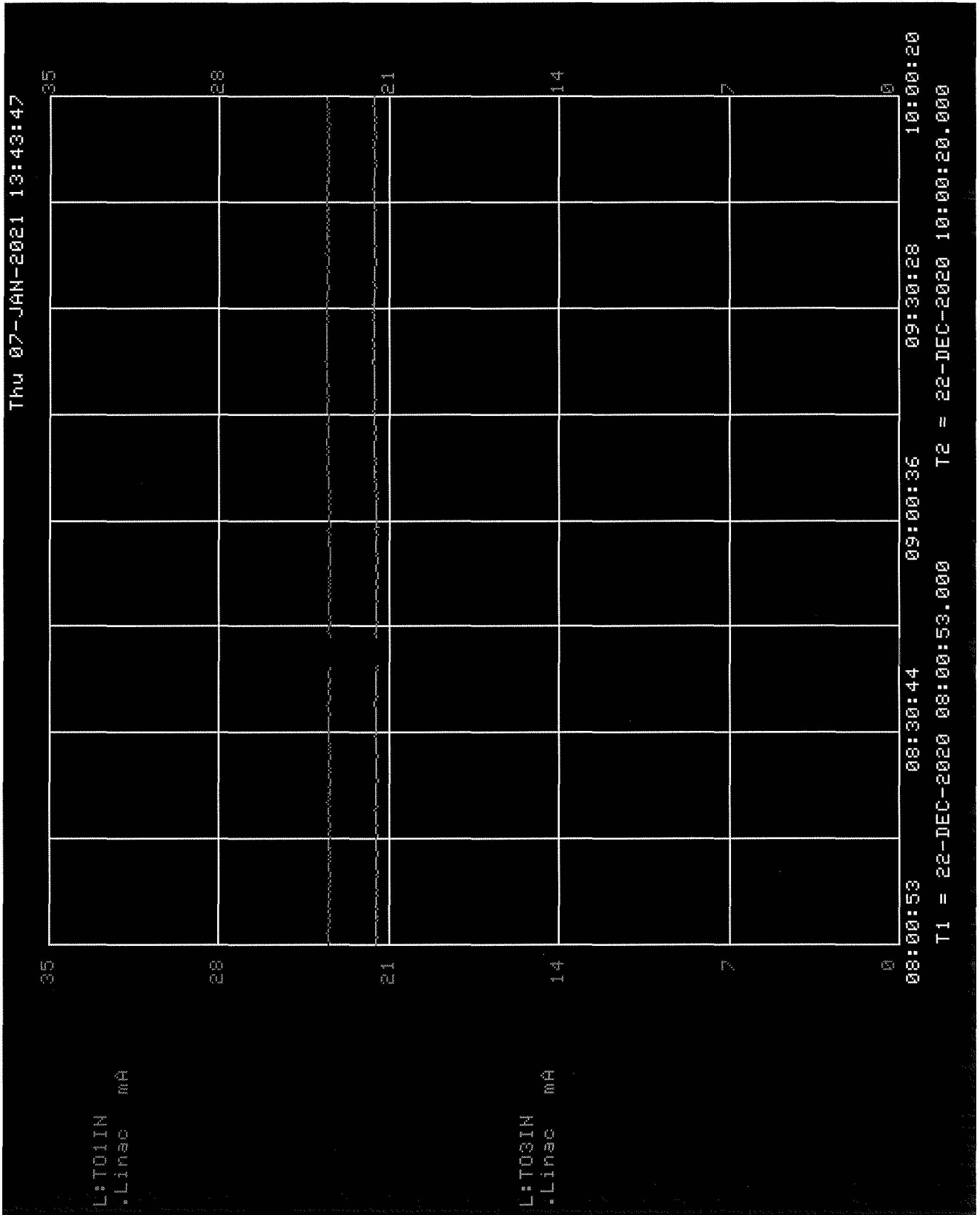
Linac Beam On Survey

Created Oct 7, 2020



All Areas < NA mR/hr@1foot (Unless otherwise indicated)			Highest Dose Rate Found: NA mR/hr@1foot	
Radiation Instruments Used			Bkgd _____ cpm Comments: Base line survey with beam off. No neutrons dose recorded. Reading were 1 minute Analyst scaler readings	
Inst Type: Analyst	REM500			
Inst No: 33	1			
Batt/Source Chk: Sat	Sat			
Cal. Due Date: 8/21	10/21			
Background: See map			Wipe # Reading Wipe # Reading _____ ccpm _____ ccpm _____ ccpm _____ ccpm _____ ccpm _____ ccpm _____ ccpm _____ ccpm _____ ccpm _____ ccpm	
LEGEND # - Dose Rate in mR/hr @ 1 ft. * - Unlabeled Radioactive Material (R) - Radioactive Material Wipe (#) - Wipe (F) - Floor Wipe			Surveyed By: <u>Fulgham/ Delao</u> Reviewed By: <u>Maddie Schoell, UID:maddiew</u> <small>Digitally signed by Maddie Schoell, UID:maddiew Date: 2021.01.15 16:28:09 -0500</small>	





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Gamma Survey Results

Bicron Results

Location	Background (cpm)	Gross Beam-On (cpm)	Net Beam-On (cpm)	Standard Deviation	Net ± St. Dev.	L _c	N _D
1	2700	2525	-175	72.28	-175 ± 72.28	120.863	244.483
2	2695	2558	-137	72.48	-137 ± 72.48	120.751	244.259
3	2722	2743	21	73.93	21 ± 73.93	121.354	245.466
4	2942	2724	-218	75.27	-218 ± 75.27	126.163	255.086
5	2982	3011	29	77.41	29 ± 77.41	127.017	256.796
6	3028	2913	-115	77.08	-115 ± 77.08	127.993	258.748
7	2908	2844	-64	75.84	-64 ± 75.84	125.432	253.623
8	2870	2873	3	75.78	3 ± 75.78	124.609	251.978
9	2942	2905	-37	76.47	-37 ± 76.47	126.163	255.086
10	2893	2906	13	76.15	13 ± 76.15	125.108	252.975
11	2843	2730	-113	74.65	-113 ± 74.65	124.022	250.803
12	2891	2965	74	76.52	74 ± 76.52	125.064	252.889
13	2562	2374	-188	70.26	-188 ± 70.26	117.733	238.223
14	2229	2484	255	68.65	255 ± 68.65	109.816	222.385
15	2209	2572	363	69.14	363 ± 69.14	109.322	221.397
16	2073	2159	86	65.05	86 ± 65.05	105.903	214.558
17	2159	2738	579	69.98	579 ± 69.98	108.078	218.908
18	2852	3009	157	76.56	157 ± 76.56	124.218	251.195

Converted to mR/hr

Background (mR/hr)	Gross Beam-On (mR/hr)	Net Beam-On (mR/hr)	Standard Deviation	Net ± St. Dev.	D _D
0.014	0.013	0.000	0.0004	0 ± 0.0004	0.001
0.013	0.013	0.000	0.0004	0 ± 0.0004	0.001
0.014	0.014	0.000	0.0004	0 ± 0.0004	0.001
0.015	0.014	0.000	0.0004	0 ± 0.0004	0.001
0.015	0.015	0.000	0.0004	0 ± 0.0004	0.001
0.015	0.015	0.000	0.0004	0 ± 0.0004	0.001
0.015	0.014	0.000	0.0004	0 ± 0.0004	0.001
0.014	0.014	0.000	0.0004	0 ± 0.0004	0.001
0.015	0.015	0.000	0.0004	0 ± 0.0004	0.001
0.014	0.015	0.000	0.0004	0 ± 0.0004	0.001
0.014	0.014	0.000	0.0004	0 ± 0.0004	0.001
0.014	0.015	0.000	0.0004	0 ± 0.0004	0.001
0.013	0.012	0.000	0.0004	0 ± 0.0004	0.001
0.011	0.012	0.001	0.0003	0.001 ± 0.0003	0.001
0.011	0.013	0.002	0.0003	0.002 ± 0.0003	0.001
0.010	0.011	0.000	0.0003	0 ± 0.0003	0.001
0.011	0.014	0.003	0.0003	0.003 ± 0.0003	0.001
0.014	0.015	0.001	0.0004	0.001 ± 0.0004	0.001

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Neutron Survey Results

Location	Average Background (mrem)	Average Background (mrem/hr)	Gross Beam-On (mrem/hr)	Net Beam-On (mrem/hr)	Sample Standard Deviation (mrem/hr)	Net \pm St. Dev. (mrem/hr)	L _{C,N}	D _{D,N}
1	0.01933	0.01933	0.000	0.000	1.08E-04	0 \pm 0.000108	2.52E-04	5.04E-04
2	0.01933	0.01933	0.000	0.000	1.08E-04	0 \pm 0.000108	2.52E-04	5.04E-04
3	0.01933	0.01933	0.000	0.000	1.08E-04	0 \pm 0.000108	2.52E-04	5.04E-04
4	0.01933	0.01933	0.000	0.000	1.08E-04	0 \pm 0.000108	2.52E-04	5.04E-04
5	0.01933	0.01933	0.000	0.000	1.08E-04	0 \pm 0.000108	2.52E-04	5.04E-04
6	0.01933	0.01933	0.000	0.000	1.08E-04	0 \pm 0.000108	2.52E-04	5.04E-04
7	0.01933	0.01933	0.000	0.000	1.08E-04	0 \pm 0.000108	2.52E-04	5.04E-04
8	0.01933	0.01933	0.000	0.000	1.08E-04	0 \pm 0.000108	2.52E-04	5.04E-04
9	0.01933	0.01933	0.000	0.000	1.08E-04	0 \pm 0.000108	2.52E-04	5.04E-04
10	0.01933	0.01933	0.000	0.000	1.08E-04	0 \pm 0.000108	2.52E-04	5.04E-04
11	0.01933	0.01933	0.000	0.000	1.08E-04	0 \pm 0.000108	2.52E-04	5.04E-04
12	0.01933	0.01933	0.000	0.000	1.08E-04	0 \pm 0.000108	2.52E-04	5.04E-04
13	0.01933	0.01933	0.000	0.000	1.08E-04	0 \pm 0.000108	2.52E-04	5.04E-04
14	0.01933	0.01933	0.000	0.000	1.08E-04	0 \pm 0.000108	2.52E-04	5.04E-04
15	0.01933	0.01933	0.000	0.000	1.08E-04	0 \pm 0.000108	2.52E-04	5.04E-04
16	0.01933	0.01933	0.000	0.000	1.08E-04	0 \pm 0.000108	2.52E-04	5.04E-04
17	0.01933	0.01933	0.000	0.000	1.08E-04	0 \pm 0.000108	2.52E-04	5.04E-04
18	0.01933	0.01933	0.000	0.000	1.08E-04	0 \pm 0.000108	2.52E-04	5.04E-04

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Scaling Dose Rates to Linac Operating Limit Intensity & Calculate Annual Dose

At Survey Intensity

Scaled to Operating Limit Intensity at Standard Beam Up-Time

Location	At Survey Intensity		Scaled to Operating Limit Intensity at Standard Beam Up-Time			Scaled to Operating Limit Intensity at Standard Beam Up-Time		
	Gamma Net Beam- On (mR/hr)	Neutron Net Beam- On (mrem/hr)	Gamma Net Beam- On (mR/hr)	Gamma 2,000 hr Working Year (mrem)	Gamma 24/7/365 (mrem)	Neutron Net Beam- On (mrem/hr)	Neutron 2,000 hr Working Year (mrem)	Neutron 24/7/365 (mrem)
1	0.000	0.000	0	0	0.000	0	0	0
2	0.000	0.000	0	0	0.000	0	0	0
3	0.000	0.000	0	0	0.000	0	0	0
4	0.000	0.000	0	0	0.000	0	0	0
5	0.000	0.000	0	0	0.000	0	0	0
6	0.000	0.000	0	0	0.000	0	0	0
7	0.000	0.000	0	0	0.000	0	0	0
8	0.000	0.000	0	0	0.000	0	0	0
9	0.000	0.000	0	0	0.000	0	0	0
10	0.000	0.000	0	0	0.000	0	0	0
11	0.000	0.000	0	0	0.000	0	0	0
12	0.000	0.000	0	0	0.000	0	0	0
13	0.000	0.000	0	0	0.000	0	0	0
14	0.001	0.000	0.00295	5.9	25.842	0	0	0
15	0.002	0.000	0.0059	11.8	51.684	0	0	0
16	0.000	0.000	0	0	0.000	0	0	0
17	0.003	0.000	0.00885	17.7	77.526	0	0	0
18	0.001	0.000	0.00295	5.9	25.842	0	0	0

Intensities (protons/hr)	
Survey	Op. Limit
1.20E+17	3.54E+17

Beam Up-Time	
# Weeks	52
Efficiency	100%
100.0%	