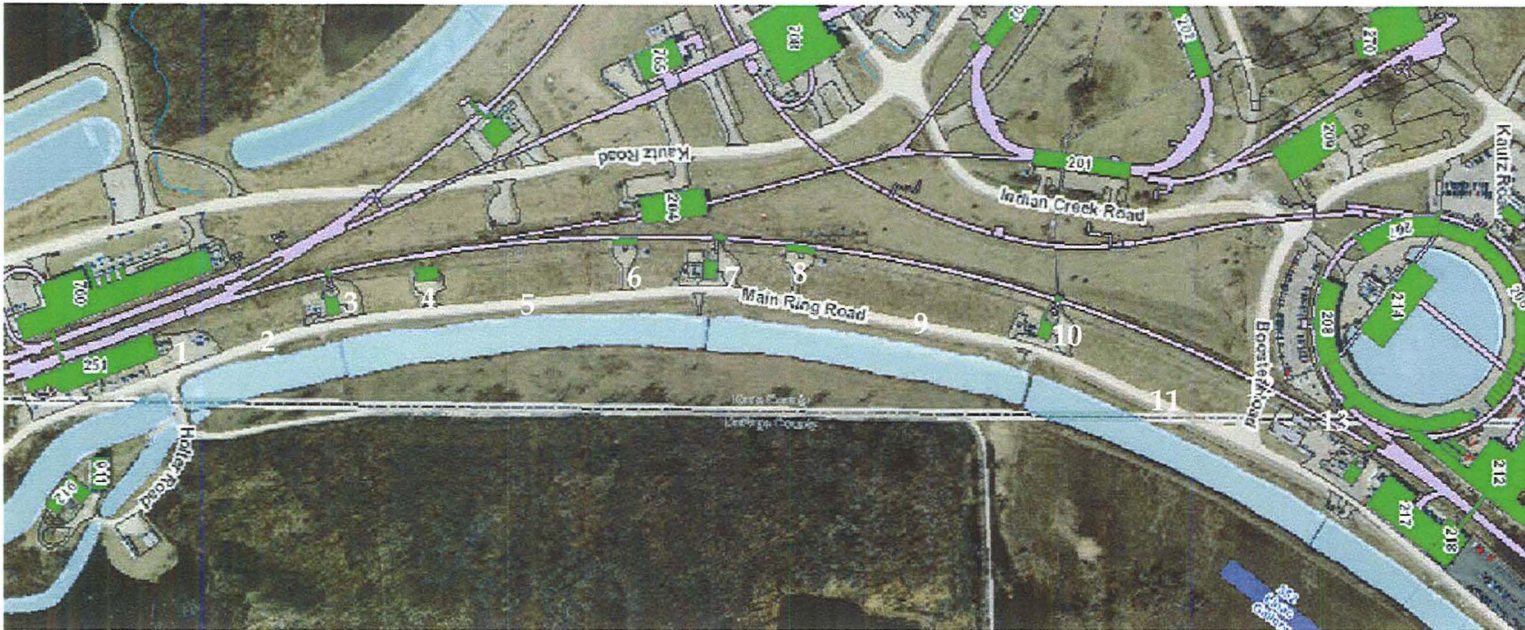


## F-Sector Beam On Survey

Created Dec 8, 2020

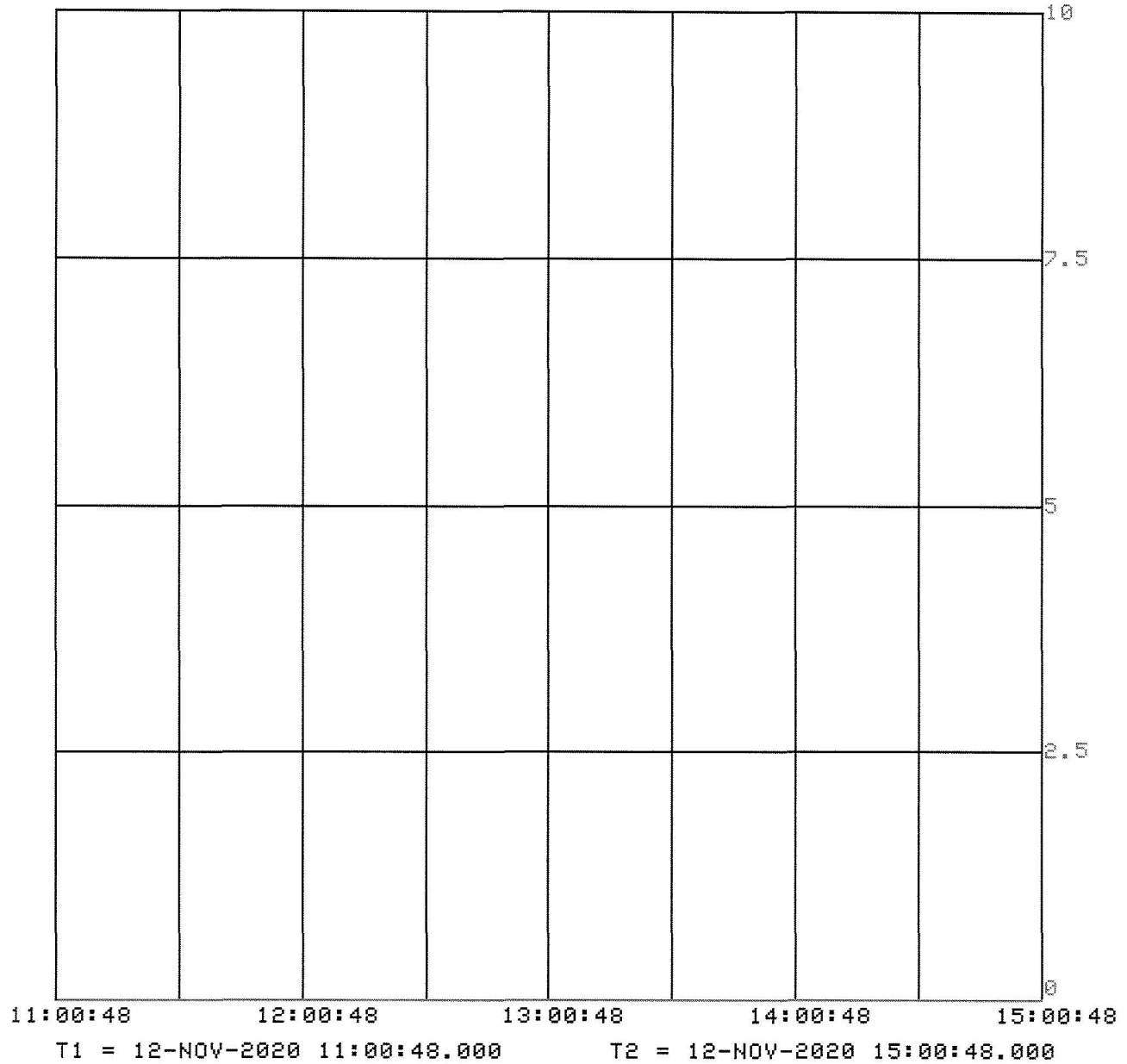
location	Gamma cpm	Neutron mrem/min
1	1176	N/A
2	1339	
3	1247	
4	1295	
5	1349	
6	1357	
7	1487	
8	1399	
9	1427	
10	1391	
11	1432	
12	1194	
13	1248	



All Areas < <u>N/A</u> mR/hr@1foot (Unless otherwise indicated)				Highest Dose Rate Found: <u>N/A</u> mR/hr@1foot			
<b>Radiation Instruments Used</b>				Bkgd _____ cpm			
Inst Type: <u>BICHSEL ANALYST</u>		/		Wipe #	Reading	Wipe #	Reading
Inst No: <u>#33</u>		/		_____	_____ cpm	<u>A</u>	_____ cpm
Batt/Source Chk: <u>SAT/SAT</u>		/		_____	_____ cpm	_____	_____ cpm
Cal. Due Date: <u>Nov/2021</u>		/		_____	_____ cpm	_____	_____ cpm
Background: <u>SEE ABOVE</u>		/		_____	_____ cpm	_____	_____ cpm
<b>LEGEND</b>				Comments:			
# - Dose Rate in mR/hr @ 1 ft. * - Unlabeled Radioactive Material				READINGS ARE 1 MINUTE INTEGRATIONS.			
Ⓡ - Radioactive Material Wipe    Ⓝ - Wipe    Ⓟ - Floor Wipe				No neutron background taken due to no source from beam			
				Surveyed By: <u>[Signature]</u>			
				Reviewed By: <u>Maddie Schoell, UID:maddiew</u> <small>Digitally signed by Maddie Schoell, UID:maddiew Date: 2021.01.25 14:23:14 -0600</small>			

Fri 08-JAN-2021 08:34:55

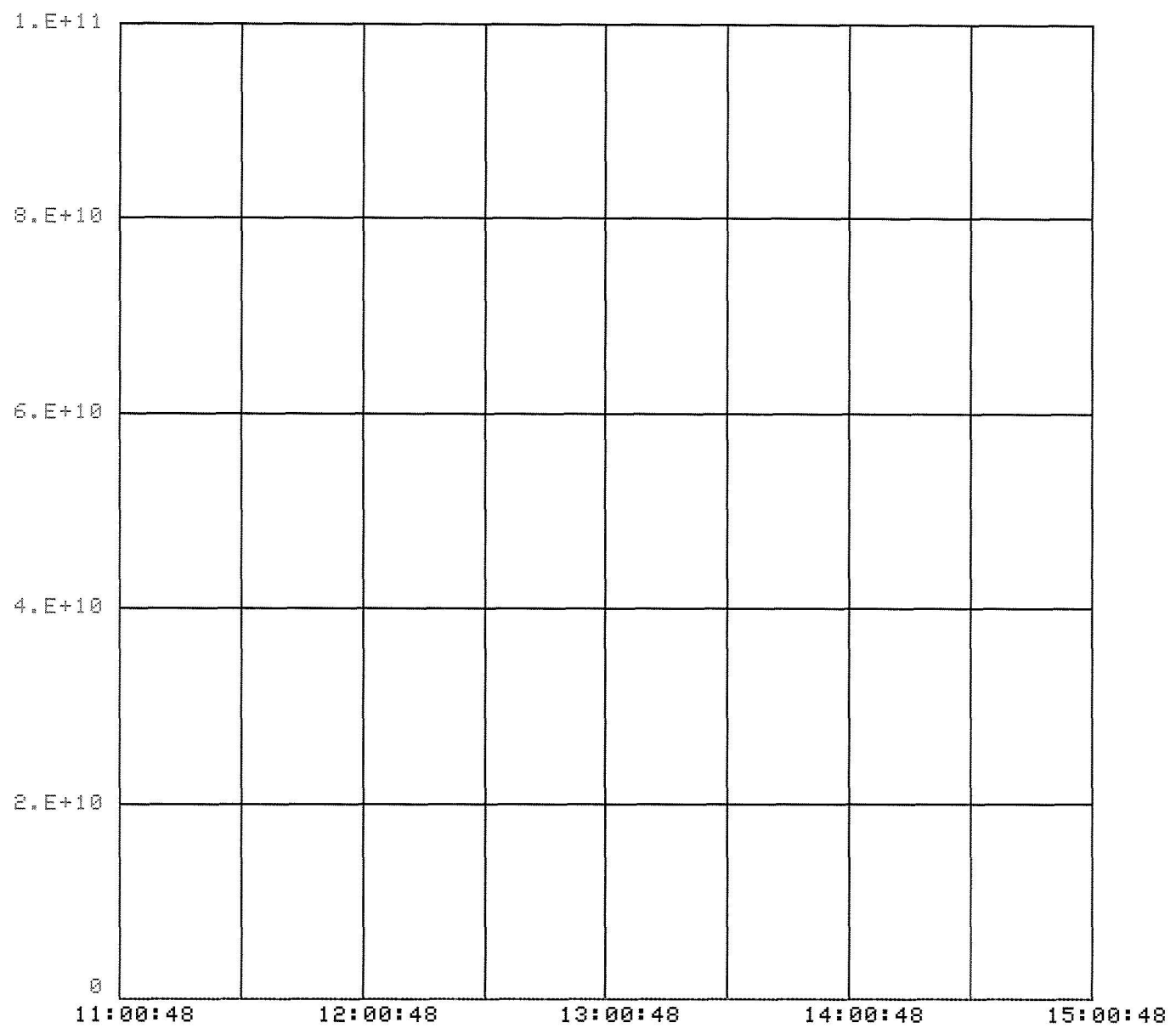
Console Location 151, 08-JAN-21 08:35:04  
NuMI shift plot #4



D:POTMIN  
.Muon4 E14

Fri 08-JAN-2021 08:35:37

F:MWISEM  
.FixTr2 ppp

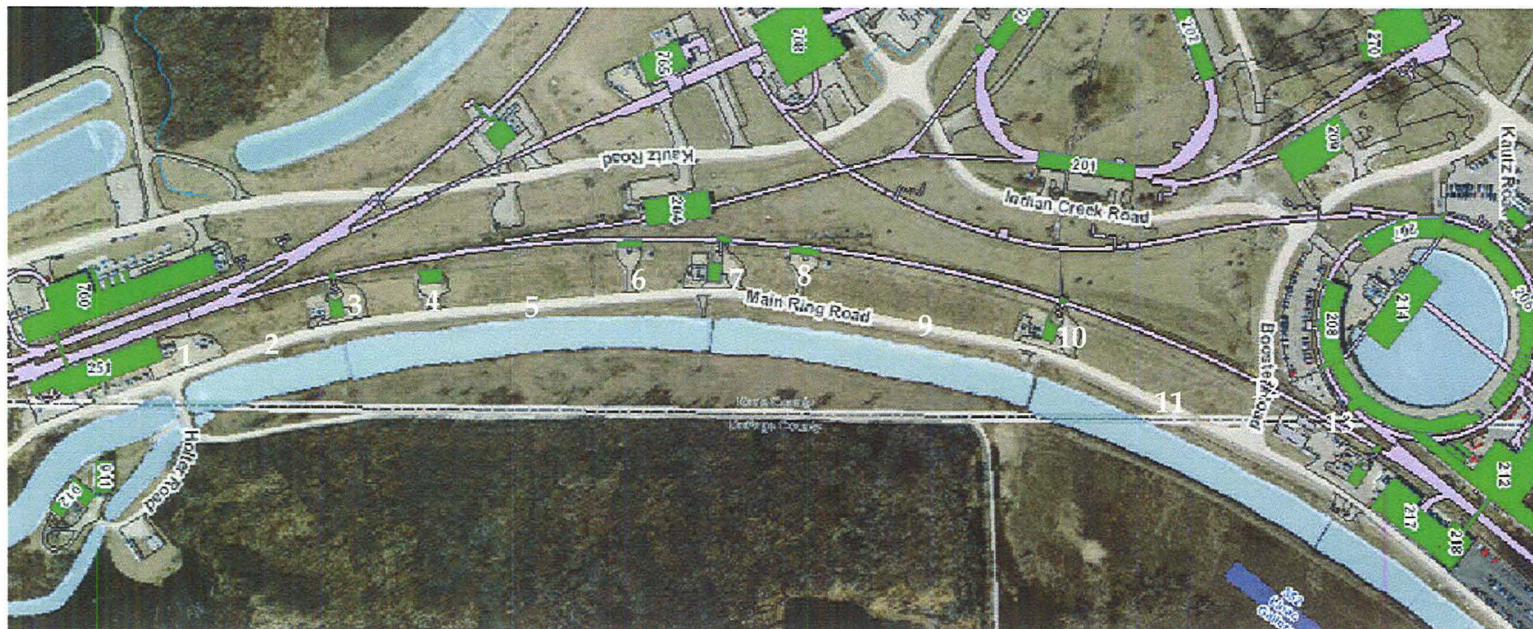


T1 = 12-NOV-2020 11:00:48.000 T2 = 12-NOV-2020 15:00:48.000

## F-Sector Beam On Survey

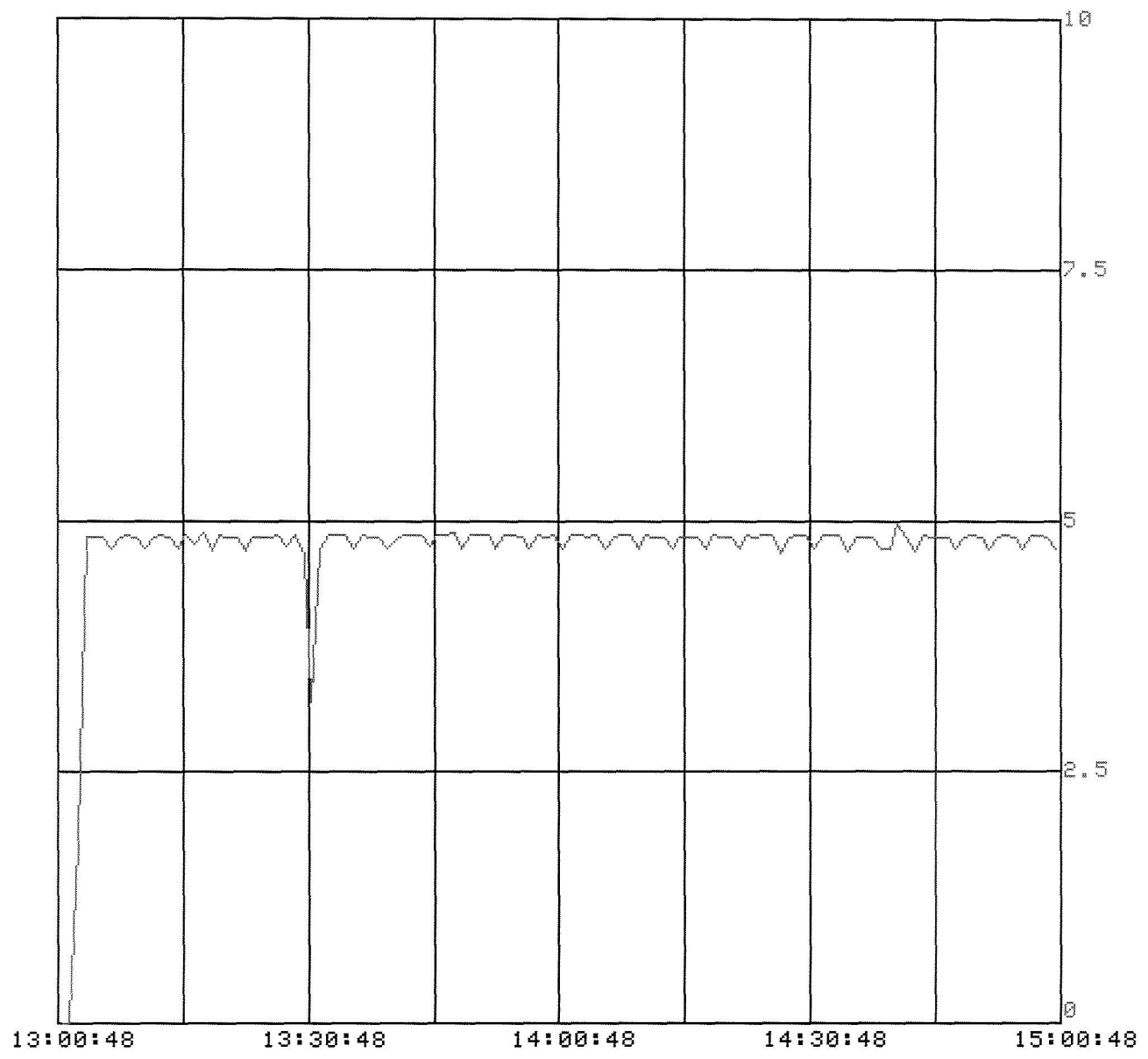
Created Dec 8, 2020

location	Gamma cpm	Neutron mrem/min
1	1041	0
2	1076	0
3	1410	0
4	1352	0
5	1423	0
6	4064	0
7	3549	0
8	1931	0
9	1339	0
10	1124	0
11	1140	0
12	986	0
13	934	0



All Areas < <i>N/A</i> mR/hr@1foot (Unless otherwise indicated)		Highest Dose Rate Found: <i>N/A</i> mR/hr@1foot			
<b>Radiation Instruments Used</b>		Comments: <i>Reading are 1 minute integrations</i>			
Inst Type: <i>Analyst</i>	<i>REM 500</i>			Bkgd _____ cpm	
Inst No: <i>26</i>	<i>1</i>			Wipe #	Reading
Batt/Source Chk: <i>SAT</i>	<i>SAT</i>			_____	_____
Cal. Due Date: <i>5-21</i>	<i>10-21</i>			_____	_____
Background: <i>N/A</i>	<i>N/A</i>	_____	_____		
<b>LEGEND</b>		_____ ccpm      _____ ccpm _____ ccpm      _____ ccpm _____ ccpm      _____ ccpm _____ ccpm      _____ ccpm _____ ccpm      _____ ccpm			
# - Dose Rate in mR/hr @ 1 ft.    * - Unlabeled Radioactive Material (#R) - Radioactive Material Wipe    (#) - Wipe    (#F) - Floor Wipe		Surveyed By: <i>Fulgham</i> Reviewed By: <i>Maddie Schoell, UID:maddiew</i>			

Fri 08-JAN-2021 08:30:57

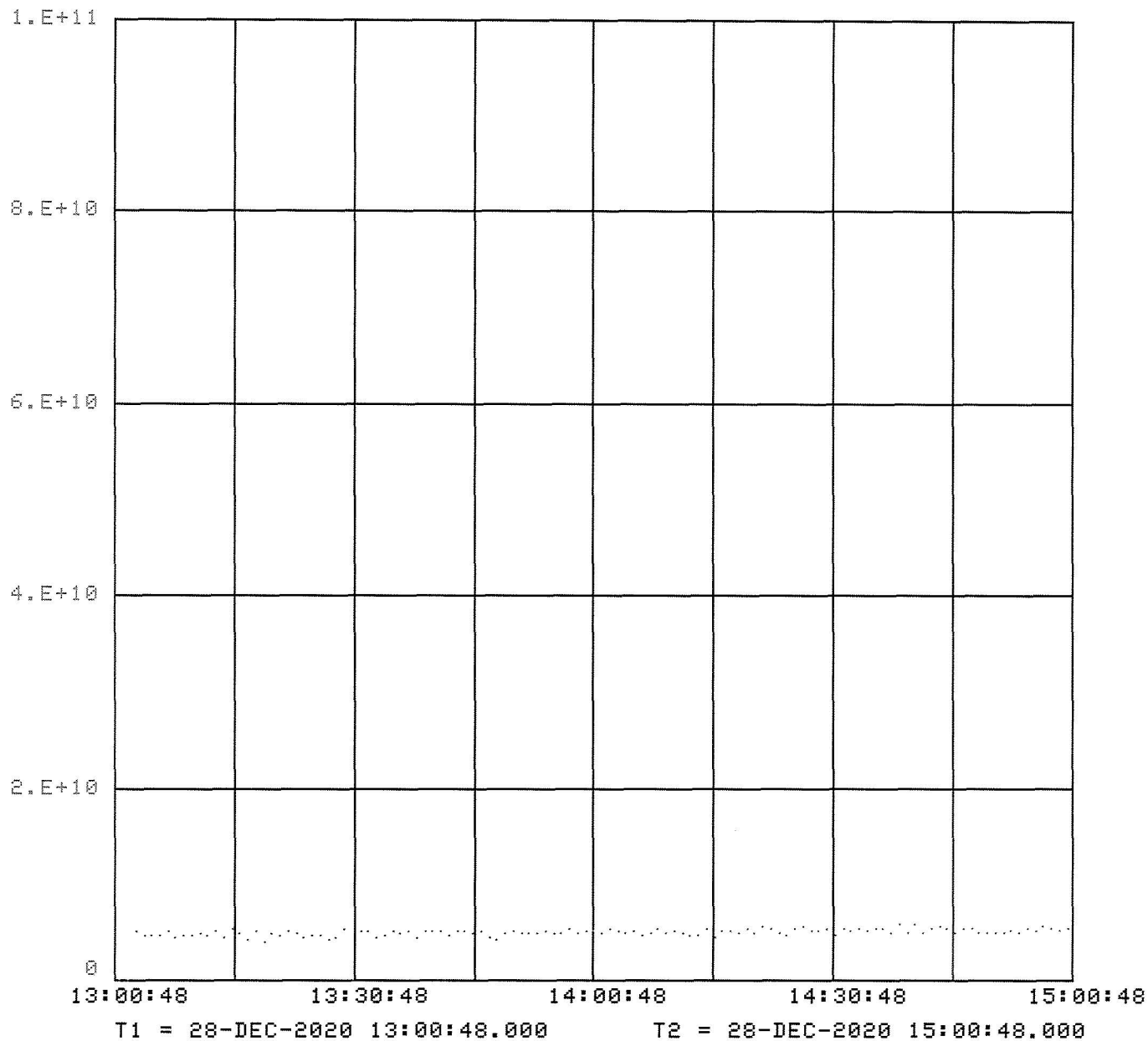


D:POTMIN  
.Muon4 E14

T1 = 28-DEC-2020 13:00:48.000 T2 = 28-DEC-2020 15:00:48.000

Fri 08-JAN-2021 08:37:12

F:MWISEM  
.FixTr2 ppp



## F Sector

### Gamma Survey Results

#### Bicron Results

Location	Background (cpm)	Gross Beam-On (cpm)	Net Beam-On (cpm)	Standard Deviation	Net ± St. Dev.	L <sub>c</sub>	N <sub>D</sub>
1	1176	1041	-135	47.09	-135 ± 47.09	79.765	162.271
2	1339	1076	-263	49.14	-263 ± 49.14	85.114	172.970
3	1247	1410	163	51.55	163 ± 51.55	82.138 !	167.017
4	1295	1352	57	51.45	57 ± 51.45	83.704	170.149
5	1349	1423	74	52.65	74 ± 52.65	85.431	173.605
6	1357	4064	2707	73.63	2707 ± 73.63	85.684 !	174.111
7	1487	3549	2062	70.96	2062 ± 70.96	89.694 !	182.133
8	1399	1931	532	57.71	532 ± 57.71	87.000 !	176.743
9	1427	1339	-88	52.59	-88 ± 52.59	87.866	178.476
10	1391	1124	-267	50.15	-267 ± 50.15	86.751	176.245
11	1432	1140	-292	50.71	-292 ± 50.71	88.020	178.784
12	1194	986	-208	46.69	-208 ± 46.69	80.373	163.487
13	1248	934	-314	46.71	-314 ± 46.71	82.171	167.083

#### Converted to mR/hr

Background (mR/hr)	Gross Beam-On (mR/hr)	Net Beam-On (mR/hr)	Standard Deviation	Net ± St. Dev.	D <sub>D</sub>
0.006	0.005	0.000	0.0002	0 ± 0.0002	0.001
0.007	0.005	0.000	0.0002	0 ± 0.0002	0.001
0.006	0.007	0.001	0.0003	0.001 ± 0.0003	0.001
0.006	0.007	0.000	0.0003	0 ± 0.0003	0.001
0.007	0.007	0.000	0.0003	0 ± 0.0003	0.001
0.007	0.020	0.014	0.0004	0.014 ± 0.0004	0.001
0.007	0.018	0.010	0.0004	0.01 ± 0.0004	0.001
0.007	0.010	0.003	0.0003	0.003 ± 0.0003	0.001
0.007	0.007	0.000	0.0003	0 ± 0.0003	0.001
0.007	0.006	0.000	0.0003	0 ± 0.0003	0.001
0.007	0.006	0.000	0.0003	0 ± 0.0003	0.001
0.006	0.005	0.000	0.0002	0 ± 0.0002	0.001
0.006	0.005	0.000	0.0002	0 ± 0.0002	0.001

## F Sector

### 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 <sub>C,N</sub>	D <sub>D,N</sub>
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



## F Sector

Scaling Dose Rates to P1-P2 Line to Muon Campus 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	0.000	0.000	0.000	0	0	0
2	0.000	0.000	0.000	0.000	0.000	0	0	0
3	0.001	0.000	0.007	13.000	38.544	0	0	0
4	0.000	0.000	0.000	0.000	0.000	0	0	0
5	0.000	0.000	0.000	0.000	0.000	0	0	0
6	0.014	0.000	0.091	182.000	539.616	0	0	0
7	0.010	0.000	0.065	130.000	385.440	0	0	0
8	0.003	0.000	0.020	39.000	115.632	0	0	0
9	0.000	0.000	0.000	0.000	0.000	0	0	0
10	0.000	0.000	0.000	0.000	0.000	0	0	0
11	0.000	0.000	0.000	0.000	0.000	0	0	0
12	0.000	0.000	0.000	0.000	0.000	0	0	0
13	0.000	0.000	0.000	0.000	0.000	0	0	0

Intensities (protons/hr)	
Survey	Op. Limit
1.00E+16	6.50E+16

Beam Up-Time	
# Weeks	44
Efficiency	80%
<b>67.7%</b>	

## F Sector

Scaling Dose Rates to P1-P2 Line to Switchyard 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	0.000	0.000	0.000	0	0	0
2	0.000	0.000	0.000	0.000	0.000	0	0	0
3	0.001	0.000	0.003	5.538	16.421	0	0	0
4	0.000	0.000	0.000	0.000	0.000	0	0	0
5	0.000	0.000	0.000	0.000	0.000	0	0	0
6	0.014	0.000	0.039	77.538	229.896	0	0	0
7	0.010	0.000	0.028	55.385	164.211	0	0	0
8	0.003	0.000	0.008	16.615	49.263	0	0	0
9	0.000	0.000	0.000	0.000	0.000	0	0	0
10	0.000	0.000	0.000	0.000	0.000	0	0	0
11	0.000	0.000	0.000	0.000	0.000	0	0	0
12	0.000	0.000	0.000	0.000	0.000	0	0	0
13	0.000	0.000	0.000	0.000	0.000	0	0	0

Intensities (protons/hr)

Survey Op. Limit

1.30E+13 3.60E+13

Beam Up-Time

# Weeks 44  
Efficiency 80%

67.7%