Rev.02 of June 16, 2002

Doses from the VJ beam pipe

Here are given results of simulations of dose rate that results from activation of the beam pipe section placed inside removable part of the Forward Shield (Z_{min}=1300 cm, Z_{max}= 1865 cm).

1. Both high-energy hadrons and low-energy neutrons activation was taken into account.
2. Design of VJ beam-pipe was taken after LHCVC1J_0002 drawing. The beam-pipe is made of stainless steel (316 L), accept for Vacuum Support structure which assumed to be5 mm thick aluminum.
3. Geometry taken for activation calculations is given in the table 1 (VJ) and table 2 (Vacuum Support structure). A sketch of the beam pipe is given on fig. 1.
4. For the purpose of the study the beam pipe was subdivided onto a set of circular radiation sources centered along Z-axis and the dose was calculated as sum over all the sources. At that the doses will be conservative as no self-attenuation of gamma radiation was taken into account. Consequently doses may be slightly overestimated by some 10%. The only element, which self-attenuation cannot be neglected is thick aluminum flange at the end of vacuum support structure (see table 2, #36). Contribution from the flange was calculated separately with DOT-3.0.
5. Results for VJ beam-pipe without vacuum support structure are given in tables 3 (hadron activation) and 4 (neutron activation). Results for VJ beam-pipe with vacuum support structure are given in tables 5 (hadron activation) and 6 (neutron activation). All doses are in μSv/h. Dimensions are given in cm from the interaction point.

Table 1

Material zones of the VJ beam pipe section (SS)

##	Z_{min}, cm	Z_{max}, cm	R_{min}, cm	R_{max}, cm	Mass, kg	Comment
1	1300.7	1302.9	4	6.3	1.276	Flange
2	1302.9	1320.7	4	4.1	0.353	Tube
3	1320.7	1332.1	4	4.18	0.411	Bellows
4	1332.1	1392.8	4	4.1	1.204	Tube
5	1392.8	1404.2	4	4.18	0.411	Bellows
6	1404.2	1434.2	4	4.1	0.595	Tube
7	1434.2	1441.6	5.1	5.2	0.187	Cone
8	1441.6	1792.5	6	6.15	15.663	Tube
9	1792.5	1805	6	6.19	0.709	Bellows
10	1805	1832	6	6.15	1.205	Tube
11	1832	1844.5	6	6.19	0.709	Bellows
12	1844.5	1862.8	6	6.15	0.817	Tube
13	1862.8	1865	6	8.3	1.772	Flange

Table 2

Material zones of the Vacuum Support structure (AL)

##	Z_{min}, cm	Z_{max}, cm	R_{min}, cm	R_{max}, cm	Mass, kg	Comment
14	1312.6	1337.6	8.69	9.19	1.89	Cone
15	1337.6	1362.6	9.22	9.72	2.01	Cone
16	1362.6	1387.6	9.74	10.24	2.12	Cone
17	1387.6	1412.6	10.27	10.77	2.23	Cone
18	1412.6	1437.6	10.8	11.3	2.34	Cone
19	1437.6	1462.6	11.32	11.82	2.45	Cone
20	1462.6	1487.6	11.85	12.35	2.56	Cone
21	1487.6	1512.6	12.38	12.88	2.68	Cone
22	1512.6	1537.6	12.9	13.4	2.79	Cone
23	1537.6	1562.6	13.43	13.93	2.90	Cone
24	1562.6	1587.6	13.96	14.46	3.01	Cone
25	1587.6	1612.6	14.48	14.98	3.12	Cone
26	1612.6	1637.6	15.01	15.51	3.23	Cone
27	1637.6	1662.6	15.54	16.04	3.35	Cone
28	1662.6	1687.6	16.06	16.56	3.46	Cone
29	1687.6	1712.6	16.59	17.09	3.57	Cone
30	1712.6	1737.6	17.12	17.62	3.68	Cone
31	1737.6	1762.6	17.64	18.14	3.79	Cone
32	1762.6	1787.6	18.17	18.67	3.90	Cone
33	1787.6	1812.6	18.7	19.2	4.02	Cone
34	1812.6	1837.6	19.22	19.72	4.13	Cone
35	1837.6	1862.6	19.75	20.25	4.24	Cone
36	1862.6	1867.6	20	60	135.65	Flange

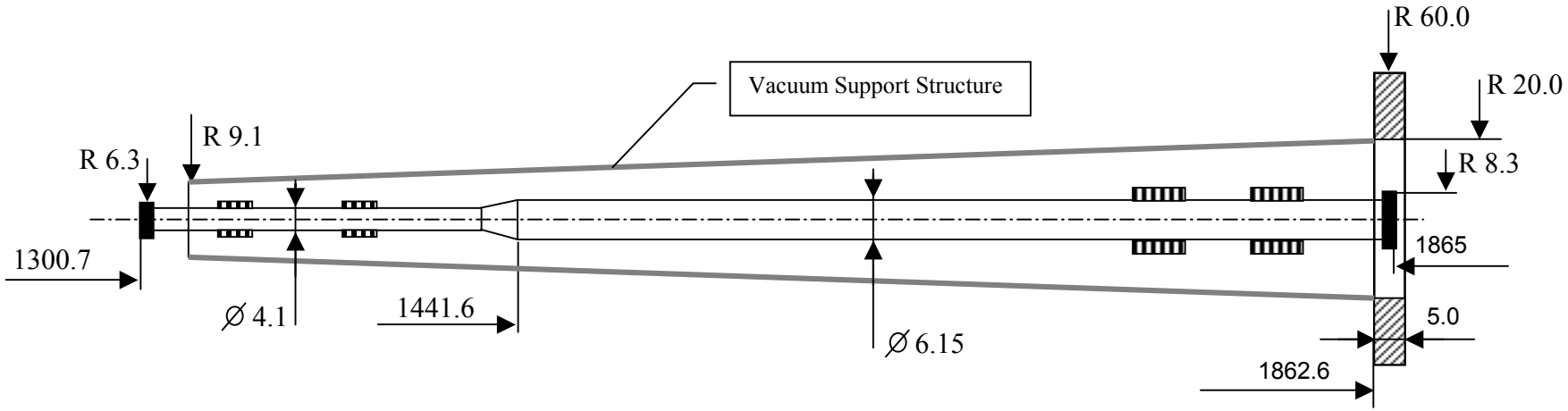

Fig. 1 Sketch of the VJ Beam pipe section.

Table 3

Equivalent dose rate induced by high-energy hadrons from VJ Beam Pipe without support structure for T= 100d, t=1d

R/Z, cm	1300	1310	1325	1360	1400	1440	1500	1560	1620	1680	1740	1800	1840	1855	1865
0	2018.3														659.3
6	1675.3	1095.4	942.3	484.8	745.3										627.5
8	1332.3	819.7	616.3	344.4	474.6	350.6	377.7	326.2	303.2	285.9	259.1	285.7	393.5	530.6	595.6
10	860.8	642.1	461.6	272.3	348.1	275.5	273.9	237.7	220.8	207.7	189.1	208.6	284.9	386.7	563.8
15	395.2	377.2	283.1	182.9	207.6	180.0	168.8	147.8	137.1	128.6	118.3	130.1	173.0	219.9	228.8
20	236.5	244.7	200.4	138.9	147.1	133.2	122.8	108.3	100.3	94.0	87.1	95.4	122.4	142.4	134.8
25	161.8	172.1	151.5	111.9	113.5	105.2	96.4	85.6	79.2	74.1	69.2	75.2	92.7	100.6	92.6
50	53.3	57.0	58.0	53.5	51.3	49.2	45.3	41.1	38.0	35.6	33.8	35.0	36.3	34.8	32.2
75	28.8	30.5	31.8	32.2	31.5	30.6	28.6	26.3	24.5	23.0	21.8	21.5	20.5	19.4	18.2
100	18.9	19.8	20.7	21.7	21.7	21.4	20.3	18.9	17.7	16.6	15.7	14.9	13.8	13.0	12.4
125	13.6	14.2	14.8	15.7	16.0	15.9	15.3	14.5	13.6	12.8	12.0	11.2	10.2	9.7	9.2
150	10.4	10.8	11.3	12.0	12.4	12.4	12.1	11.5	10.9	10.2	9.6	8.8	8.0	7.6	7.3
175	8.3	8.6	8.9	9.5	9.8	9.9	9.8	9.4	8.9	8.4	7.8	7.1	6.5	6.2	6.0
200	6.8	7.0	7.3	7.7	8.0	8.2	8.1	7.8	7.5	7.1	6.6	6.0	5.4	5.2	5.1
225	5.7	5.9	6.1	6.4	6.7	6.8	6.8	6.6	6.4	6.0	5.6	5.1	4.7	4.5	4.4

Table 3 (continuation)

Equivalent dose rate induced by high-energy hadrons from VJ Beam Pipe without support structure for T= 100 d, t= 5d

R/Z, cm	1300	1310	1325	1360	1400	1440	1500	1560	1620	1680	1740	1800	1840	1855	1865
0	1438.0														459.8
6	1193.7	780.9	672.7	345.1	529.0										437.6
8	949.5	584.4	439.9	245.2	336.9	248.7	267.4	230.4	213.9	201.7	182.6	201.2	276.0	370.6	415.3
10	613.4	457.7	329.4	193.9	247.2	195.4	193.8	167.8	155.8	146.6	133.3	146.9	199.8	270.1	393.0
15	281.7	268.9	201.9	130.2	147.4	127.7	119.5	104.4	96.7	90.8	83.4	91.6	121.3	153.6	159.7
20	168.6	174.4	142.9	98.9	104.5	94.5	87.0	76.5	70.8	66.4	61.4	67.1	85.8	99.5	94.1
25	115.3	122.7	108.0	79.6	80.6	74.6	68.3	60.5	55.9	52.3	48.8	52.9	65.0	70.4	64.7
50	38.0	40.6	41.3	38.0	36.4	34.9	32.1	29.1	26.9	25.1	23.8	24.6	25.4	24.4	22.5
75	20.5	21.7	22.6	22.9	22.4	21.7	20.2	18.6	17.3	16.2	15.4	15.1	14.4	13.6	12.8
100	13.4	14.1	14.7	15.4	15.4	15.1	14.4	13.4	12.5	11.7	11.1	10.5	9.7	9.2	8.7
125	9.7	10.1	10.5	11.2	11.4	11.3	10.9	10.2	9.6	9.0	8.5	7.9	7.2	6.8	6.5
150	7.4	7.7	8.0	8.5	8.8	8.8	8.6	8.2	7.7	7.2	6.8	6.2	5.6	5.4	5.1
175	5.9	6.1	6.3	6.7	7.0	7.0	6.9	6.7	6.3	5.9	5.5	5.0	4.6	4.4	4.2
200	4.9	5.0	5.2	5.5	5.7	5.8	5.7	5.6	5.3	5.0	4.6	4.2	3.8	3.7	3.6
225	4.1	4.2	4.3	4.6	4.8	4.8	4.8	4.7	4.5	4.2	3.9	3.6	3.3	3.2	3.1

Table 3 (continuation)

Equivalent dose rate induced by high-energy hadrons from VJ Beam Pipe without support structure for T= 100 d, t= 100d

R/Z, cm	1300	1310	1325	1360	1400	1440	1500	1560	1620	1680	1740	1800	1840	1855	1865
0	246.2														86.6
6	204.5	133.3	114.4	58.3	88.0										82.6
8	162.8	99.8	74.8	41.4	56.1	41.7	44.9	38.4	35.4	33.6	30.9	34.9	49.3	68.0	78.7
10	105.1	78.2	56.0	32.7	41.2	32.7	32.6	28.0	25.8	24.4	22.6	25.5	35.8	49.7	74.8
15	48.2	45.9	34.4	22.0	24.6	21.4	20.1	17.4	16.1	15.1	14.1	15.9	21.8	28.3	30.0
20	28.8	29.8	24.3	16.7	17.4	15.8	14.6	12.8	11.8	11.1	10.4	11.7	15.4	18.3	17.5
25	19.7	20.9	18.4	13.4	13.5	12.5	11.5	10.1	9.3	8.8	8.3	9.2	11.7	12.9	12.0
50	6.5	6.9	7.0	6.4	6.1	5.9	5.4	4.9	4.5	4.2	4.1	4.3	4.5	4.4	4.1
75	3.5	3.7	3.8	3.9	3.8	3.6	3.4	3.1	2.9	2.7	2.6	2.6	2.6	2.4	2.3
100	2.3	2.4	2.5	2.6	2.6	2.6	2.4	2.3	2.1	2.0	1.9	1.8	1.7	1.6	1.5
125	1.6	1.7	1.8	1.9	1.9	1.9	1.8	1.7	1.6	1.5	1.5	1.4	1.3	1.2	1.1
150	1.3	1.3	1.4	1.4	1.5	1.5	1.4	1.4	1.3	1.2	1.2	1.1	1.0	0.9	0.9
175	1.0	1.0	1.1	1.1	1.2	1.2	1.2	1.1	1.1	1.0	1.0	0.9	0.8	0.8	0.7
200	0.8	0.8	0.9	0.9	1.0	1.0	1.0	0.9	0.9	0.9	0.8	0.7	0.7	0.6	0.6
225	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.6	0.6	0.6	0.5

Table 3 (continuation)

Equivalent dose rate induced by high-energy hadrons from VJ Beam Pipe without support structure for T= 10y, t=1d

R/Z, cm	1300	1310	1325	1360	1400	1440	1500	1560	1620	1680	1740	1800	1840	1855	1865
0	2206.0														726.6
6	1831.4	1195.8	1029.9	530.2	814.8										691.6
8	1456.7	895.3	673.6	376.6	518.8	382.8	412.3	357.1	331.4	312.9	284.1	313.8	433.2	583.9	656.6
10	941.1	701.4	504.5	297.8	380.6	300.8	299.0	260.1	241.4	227.4	207.4	229.1	313.6	425.7	621.7
15	432.0	412.2	309.3	200.0	226.9	196.6	184.4	161.8	150.0	140.8	129.6	142.9	190.4	242.1	252.1
20	258.5	267.4	219.0	151.9	160.8	145.6	134.3	118.6	109.8	102.9	95.5	104.7	134.7	156.7	148.5
25	176.9	188.1	165.6	122.3	124.1	115.0	105.4	93.7	86.6	81.2	75.8	82.6	102.0	110.7	102.0
50	58.3	62.3	63.4	58.5	56.1	53.7	49.5	45.0	41.6	39.0	37.1	38.4	39.9	38.3	35.4
75	31.5	33.3	34.8	35.2	34.4	33.4	31.2	28.8	26.8	25.1	23.9	23.6	22.5	21.3	20.0
100	20.6	21.6	22.6	23.7	23.8	23.3	22.2	20.7	19.4	18.2	17.2	16.4	15.1	14.3	13.6
125	14.9	15.5	16.2	17.2	17.5	17.4	16.8	15.9	14.9	14.0	13.2	12.2	11.2	10.6	10.2
150	11.4	11.8	12.3	13.1	13.5	13.6	13.2	12.6	11.9	11.2	10.5	9.6	8.7	8.3	8.0
175	9.1	9.4	9.7	10.4	10.8	10.9	10.7	10.3	9.8	9.2	8.6	7.8	7.1	6.8	6.6
200	7.5	7.7	8.0	8.4	8.8	8.9	8.9	8.6	8.2	7.7	7.2	6.5	6.0	5.7	5.6
225	6.3	6.4	6.6	7.0	7.3	7.5	7.5	7.3	7.0	6.6	6.1	5.6	5.1	4.9	4.8

Table 3 (continuation)

Equivalent dose rate induced by high-energy hadrons from VJ Beam Pipe without support structure for T= 10 y, t=5d

R/Z, cm	1300	1310	1325	1360	1400	1440	1500	1560	1620	1680	1740	1800	1840	1855	1865
0	1617.6														526.6
6	1342.9	878.3	758.1	389.5	597.0										501.3
8	1068.3	657.4	495.6	276.6	380.2	280.8	302.2	260.6	241.9	228.2	207.0	228.0	314.0	423.0	476.0
10	690.2	515.0	371.1	218.7	278.9	220.6	219.1	189.8	176.2	165.8	151.1	166.4	227.3	308.4	450.7
15	317.0	302.6	227.4	146.9	166.3	144.2	135.0	118.1	109.4	102.7	94.5	103.8	138.1	175.5	182.8
20	189.7	196.3	160.9	111.5	117.9	106.7	98.3	86.6	80.1	75.1	69.6	76.1	97.7	113.6	107.6
25	129.8	138.1	121.6	89.8	91.0	84.3	77.2	68.4	63.2	59.2	55.2	60.0	74.0	80.3	74.0
50	42.8	45.8	46.6	42.9	41.1	39.4	36.2	32.9	30.4	28.4	27.0	27.9	29.0	27.8	25.7
75	23.1	24.5	25.5	25.8	25.2	24.5	22.9	21.1	19.6	18.3	17.4	17.1	16.4	15.5	14.5
100	15.1	15.8	16.6	17.4	17.4	17.1	16.2	15.1	14.1	13.3	12.6	11.9	11.0	10.4	9.9
125	10.9	11.4	11.9	12.6	12.8	12.8	12.3	11.6	10.9	10.2	9.6	8.9	8.1	7.7	7.4
150	8.4	8.7	9.0	9.6	9.9	9.9	9.7	9.2	8.7	8.2	7.7	7.0	6.4	6.1	5.8
175	6.7	6.9	7.1	7.6	7.9	8.0	7.8	7.5	7.1	6.7	6.3	5.7	5.2	5.0	4.8
200	5.5	5.6	5.8	6.2	6.4	6.5	6.5	6.3	6.0	5.6	5.3	4.8	4.4	4.2	4.0
225	4.6	4.7	4.9	5.2	5.4	5.5	5.5	5.3	5.1	4.8	4.5	4.1	3.7	3.6	3.5

Table 3 (continuation)

Equivalent dose rate induced by high-energy hadrons from VJ Beam Pipe without support structure for T= 10y, t=100d

R/Z, cm	1300	1310	1325	1360	1400	1440	1500	1560	1620	1680	1740	1800	1840	1855	1865
0	372.5														134.9
6	309.4	201.7	173.6	88.9	135.1										128.7
8	246.3	151.1	113.5	63.1	86.0	63.9	69.1	59.5	55.0	52.0	48.0	54.1	76.6	105.8	122.6
10	159.1	118.4	85.0	49.9	63.1	50.2	50.1	43.4	40.1	37.8	35.0	39.5	55.6	77.4	116.4
15	73.0	69.6	52.1	33.5	37.7	32.8	30.9	27.0	24.9	23.5	21.9	24.7	33.8	44.1	46.6
20	43.6	45.1	36.9	25.4	26.7	24.3	22.5	19.8	18.3	17.2	16.2	18.1	24.0	28.5	27.2
25	29.8	31.7	27.9	20.5	20.6	19.2	17.7	15.6	14.4	13.6	12.8	14.3	18.2	20.0	18.6
50	9.8	10.5	10.7	9.8	9.4	9.0	8.3	7.5	7.0	6.5	6.3	6.7	7.1	6.8	6.3
75	5.3	5.6	5.8	5.9	5.8	5.6	5.2	4.8	4.5	4.2	4.1	4.1	4.0	3.8	3.5
100	3.5	3.6	3.8	4.0	4.0	3.9	3.7	3.5	3.3	3.1	2.9	2.8	2.6	2.5	2.4
125	2.5	2.6	2.7	2.9	2.9	2.9	2.8	2.7	2.5	2.4	2.2	2.1	1.9	1.9	1.8
150	1.9	2.0	2.1	2.2	2.3	2.3	2.2	2.1	2.0	1.9	1.8	1.7	1.5	1.4	1.4
175	1.5	1.6	1.6	1.7	1.8	1.8	1.8	1.7	1.7	1.6	1.5	1.3	1.2	1.2	1.1
200	1.3	1.3	1.3	1.4	1.5	1.5	1.5	1.4	1.4	1.3	1.2	1.1	1.0	1.0	1.0
225	1.1	1.1	1.1	1.2	1.2	1.3	1.3	1.2	1.2	1.1	1.0	1.0	0.9	0.8	0.8

Table 4

Equivalent dose rate induced by low-energy neutrons from VJ Beam Pipe without support structure for T= 100d, t=1d

R/Z, cm	1300	1310	1325	1360	1400	1440	1500	1560	1620	1680	1740	1800	1840	1855	1865
0	40.8														92.0
6	34.3	19.5	12.7	6.5	8.9										89.8
8	27.7	14.9	8.7	4.7	5.8	6.4	9.8	8.6	8.8	9.4	11.4	18.5	32.7	58.2	87.6
10	17.6	11.8	6.7	3.7	4.3	5.0	7.1	6.3	6.4	6.9	8.4	13.6	24.5	44.1	85.4
15	7.8	6.9	4.4	2.6	2.7	3.3	4.3	4.0	4.0	4.3	5.4	8.6	15.6	25.6	31.2
20	4.6	4.5	3.2	2.0	2.0	2.4	3.1	2.9	3.0	3.2	4.0	6.4	11.3	16.2	17.1
25	3.1	3.1	2.5	1.7	1.6	1.9	2.4	2.3	2.4	2.6	3.2	5.1	8.7	11.1	11.1
50	1.0	1.0	1.0	0.9	0.9	1.0	1.1	1.1	1.2	1.3	1.7	2.4	3.2	3.3	3.2
75	0.5	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.8	0.9	1.1	1.4	1.7	1.6	1.6
100	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.6	0.7	0.8	1.0	1.0	1.0	1.0
125	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.6	0.7	0.7	0.7	0.7
150	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5
175	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4
200	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
225	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3

Table 4 (continuation)

Equivalent dose rate induced by low-energy neutrons from VJ Beam Pipe without support structure for T= 100d, t=5d

R/Z, cm	1300	1310	1325	1360	1400	1440	1500	1560	1620	1680	1740	1800	1840	1855	1865
0	38.9														84.2
6	32.6	18.6	12.1	6.1	8.4										82.1
8	26.4	14.2	8.2	4.4	5.5	6.0	9.2	8.1	8.2	8.6	10.3	16.6	29.5	52.9	80.1
10	16.8	11.2	6.4	3.5	4.1	4.7	6.6	5.9	6.0	6.3	7.6	12.2	22.1	40.2	78.1
15	7.4	6.6	4.1	2.4	2.6	3.1	4.0	3.7	3.7	4.0	4.9	7.8	14.2	23.3	28.5
20	4.3	4.2	3.0	1.9	1.9	2.3	2.9	2.7	2.8	3.0	3.6	5.8	10.3	14.8	15.6
25	2.9	3.0	2.4	1.6	1.5	1.8	2.3	2.2	2.2	2.4	2.9	4.6	7.9	10.1	10.1
50	0.9	1.0	1.0	0.8	0.8	0.9	1.1	1.1	1.1	1.2	1.5	2.2	2.9	3.0	2.9
75	0.5	0.5	0.5	0.5	0.6	0.6	0.7	0.7	0.7	0.8	1.0	1.3	1.5	1.5	1.4
100	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.7	0.9	0.9	0.9	0.9
125	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.6	0.6	0.6	0.6
150	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.5
175	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.3
200	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3
225	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2

Table 4 (continuation)

Equivalent dose rate induced by low-energy neutrons from VJ Beam Pipe without support structure for T= 100 d, t=100 d

R/Z, cm	1300	1310	1325	1360	1400	1440	1500	1560	1620	1680	1740	1800	1840	1855	1865
0	17.3														42.2
6	14.5	8.3	5.5	2.8	3.9										41.2
8	11.7	6.3	3.7	2.0	2.5	2.8	4.2	3.8	3.9	4.3	5.4	8.9	15.5	27.0	40.2
10	7.5	5.0	2.9	1.6	1.9	2.2	3.1	2.8	2.9	3.1	4.0	6.5	11.5	20.4	39.1
15	3.3	2.9	1.9	1.1	1.2	1.4	1.9	1.7	1.8	2.0	2.5	4.1	7.3	11.9	14.4
20	1.9	1.9	1.4	0.9	0.9	1.1	1.4	1.3	1.3	1.5	1.9	3.0	5.3	7.5	7.9
25	1.3	1.3	1.1	0.7	0.7	0.8	1.1	1.0	1.1	1.2	1.5	2.4	4.1	5.2	5.1
50	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.8	1.1	1.5	1.5	1.5
75	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.7	0.8	0.8	0.7
100	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.5	0.5	0.5	0.5
125	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
150	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
175	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2
200	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1
225	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

Table 4 (continuation)

Equivalent dose rate induced by low-energy neutrons from VJ Beam Pipe without support structure for T= 10y, t=1d

R/Z, cm	1300	1310	1325	1360	1400	1440	1500	1560	1620	1680	1740	1800	1840	1855	1865
0	57.6														204.9
6	48.4	28.0	19.6	10.4	14.5										199.8
8	39.2	21.5	13.2	7.4	9.4	10.4	16.1	15.0	16.4	19.8	28.0	48.6	82.3	135.5	194.8
10	25.0	17.0	10.2	6.0	7.1	8.2	11.7	11.0	12.0	14.5	20.6	35.5	60.9	102.1	189.8
15	11.2	10.0	6.6	4.1	4.4	5.3	7.2	7.0	7.6	9.2	13.0	22.2	38.2	59.1	70.2
20	6.6	6.5	4.8	3.2	3.3	4.0	5.2	5.2	5.7	6.9	9.7	16.3	27.4	37.6	38.8
25	4.5	4.6	3.7	2.6	2.7	3.2	4.1	4.1	4.5	5.5	7.8	12.9	20.8	25.8	25.4
50	1.5	1.6	1.6	1.4	1.4	1.6	1.9	2.1	2.3	2.9	3.9	5.9	7.6	7.8	7.4
75	0.8	0.9	0.9	0.9	1.0	1.1	1.3	1.4	1.6	1.9	2.5	3.5	3.9	3.9	3.7
100	0.6	0.6	0.6	0.7	0.7	0.8	0.9	1.0	1.2	1.4	1.8	2.3	2.4	2.4	2.3
125	0.5	0.5	0.5	0.5	0.6	0.6	0.7	0.8	1.0	1.1	1.4	1.6	1.6	1.6	1.6
150	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.7	0.8	0.9	1.1	1.2	1.2	1.2	1.1
175	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.7	0.7	0.8	0.9	0.9	0.9	0.9
200	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.6	0.6	0.7	0.7	0.7	0.7	0.7
225	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.6	0.6	0.6

Table 4 (continuation)

Equivalent dose rate induced by low-energy neutrons from VJ Beam Pipe without support structure for T= 10y, t=5d

R/Z, cm	1300	1310	1325	1360	1400	1440	1500	1560	1620	1680	1740	1800	1840	1855	1865
0	55.4														196.5
6	46.6	27.0	18.8	10.0	14.0										191.7
8	37.7	20.6	12.7	7.2	9.1	10.0	15.5	14.4	15.8	19.0	26.8	46.5	78.9	129.9	186.9
10	24.1	16.3	9.8	5.7	6.8	7.9	11.2	10.6	11.6	13.9	19.7	34.0	58.4	98.0	182.0
15	10.8	9.6	6.3	3.9	4.2	5.1	6.9	6.7	7.3	8.8	12.5	21.3	36.6	56.6	67.3
20	6.3	6.2	4.6	3.1	3.2	3.9	5.0	5.0	5.4	6.6	9.3	15.6	26.3	36.0	37.2
25	4.3	4.4	3.6	2.5	2.6	3.1	3.9	4.0	4.4	5.3	7.5	12.3	19.9	24.8	24.4
50	1.4	1.5	1.5	1.4	1.4	1.6	1.9	2.0	2.2	2.8	3.8	5.6	7.3	7.5	7.1
75	0.8	0.9	0.9	0.9	0.9	1.0	1.2	1.3	1.5	1.9	2.4	3.3	3.7	3.7	3.6
100	0.6	0.6	0.6	0.7	0.7	0.8	0.9	1.0	1.2	1.4	1.7	2.2	2.3	2.3	2.2
125	0.4	0.5	0.5	0.5	0.6	0.6	0.7	0.8	0.9	1.1	1.3	1.5	1.6	1.5	1.5
150	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.1	1.1	1.1
175	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.6	0.6	0.7	0.8	0.9	0.9	0.9	0.8
200	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.7	0.7	0.7	0.7	0.7
225	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.6	0.6	0.5

Table 4 (continuation)

Equivalent dose rate induced by low-energy neutrons from VJ Beam Pipe without support structure for T= 10y, t=100d

R/Z, cm	1300	1310	1325	1360	1400	1440	1500	1560	1620	1680	1740	1800	1840	1855	1865
0	30.0														145.3
6	25.2	14.8	11.0	6.0	8.5										141.7
8	20.5	11.4	7.4	4.3	5.6	6.2	9.6	9.3	10.6	13.7	20.7	36.8	61.5	98.1	138.1
10	13.1	9.0	5.7	3.5	4.2	4.8	7.0	6.8	7.8	10.0	15.2	26.9	45.3	73.7	134.5
15	5.9	5.3	3.6	2.4	2.6	3.2	4.3	4.3	5.0	6.4	9.6	16.7	28.2	42.6	50.0
20	3.5	3.5	2.7	1.9	1.9	2.4	3.1	3.2	3.7	4.8	7.2	12.2	20.2	27.1	27.8
25	2.4	2.5	2.1	1.5	1.6	1.9	2.5	2.6	3.0	3.9	5.7	9.6	15.3	18.7	18.2
50	0.8	0.9	0.9	0.8	0.9	1.0	1.2	1.3	1.6	2.0	2.9	4.3	5.6	5.7	5.4
75	0.5	0.5	0.5	0.6	0.6	0.7	0.8	0.9	1.1	1.4	1.8	2.5	2.8	2.8	2.7
100	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.7	0.8	1.0	1.3	1.6	1.7	1.7	1.7
125	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.6	0.7	0.8	1.0	1.2	1.2	1.2	1.1
150	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.5	0.5	0.6	0.8	0.9	0.9	0.8	0.8
175	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.5	0.5	0.6	0.7	0.7	0.6	0.6
200	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.5	0.5
225	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4

Table 5

Equivalent dose rate induced by high-energy hadrons from VJ Beam Pipe with Aluminum support structure for T= 100d, t=1d

R/Z, cm	1300	1310	1325	1360	1400	1440	1500	1560	1620	1680	1740	1800	1840	1855	1865
0	2033														
6	1685	1127													
8	1338	854													
10	876	676	567	374											
15	409	402	327	233	259	231	221	200							
20	248	263	228	173	181	167	155	139	131	126	123	144	202	250	
25	172	186	172	137	139	131	121	109	102	97	94	109	153	197	
50	59	64	66	64	62	60	56	52	49	47	46	53	69	80	
75	33	35	37	38	38	37	36	33	32	30	31	34	36	31	29
100	22	23	24	26	26	26	25	24	23	22	22	23	21	18	17
125	16	17	17	19	19	20	19	18	18	17	17	17	15	12	12
150	12	13	13	14	15	15	15	15	14	14	14	13	11	10	9
175	10	10	11	11	12	12	12	12	12	11	11	10	9	8	7
200	8	8	9	9	10	10	10	10	10	10	9	8	7	6	6
225	7	7	7	8	8	9	9	9	8	8	8	7	6	6	5

Table 5 (continuation)

Equivalent dose rate induced by high-energy hadrons from VJ Beam Pipe with Aluminum support structure for T= 100 d, t= 5d

R/Z, cm	1300	1310	1325	1360	1400	1440	1500	1560	1620	1680	1740	1800	1840	1855	1865
0	1441														
6	1193	785													
8	946	591													
10	617	465	353	216											
15	285	274	212	141	159	139	131	117							
20	171	178	149	106	112	102	94	84	78	74	70	80	109	132	
25	118	126	113	85	87	80	74	66	61	58	55	62	83	100	
50	39	42	43	40	39	37	35	32	29	28	27	30	35	38	
75	21	23	24	24	24	23	22	20	19	18	18	19	19	17	16
100	14	15	16	16	17	16	16	15	14	13	13	13	12	10	10
125	10	11	11	12	12	12	12	11	11	10	10	9	8	7	7
150	8	8	9	9	9	9	9	9	9	8	8	7	6	6	6
175	6	7	7	7	8	8	8	7	7	7	6	6	5	5	5
200	5	5	6	6	6	6	6	6	6	6	5	5	4	4	4
225	4	4	5	5	5	5	5	5	5	5	5	4	4	3	3

Table 5 (continuation)

Equivalent dose rate induced by high-energy hadrons from VJ Beam Pipe with Aluminum support structure for T= 100 d, t= 100d

R/Z, cm	1300	1310	1325	1360	1400	1440	1500	1560	1620	1680	1740	1800	1840	1855	1865
0	249														
6	206	139													
8	164	106													
10	108	84	73	49											
15	50	50	41	30	33	30	29	26							
20	31	33	29	22	23	21	20	18	17	17	17	21	32	42	
25	21	23	22	18	18	17	16	14	13	13	13	16	25	34	
50	7	8	8	8	8	8	7	7	6	6	7	8	12	14	
75	4	4	5	5	5	5	5	4	4	4	4	5	6	5	4
100	3	3	3	3	3	3	3	3	3	3	3	4	3	2	2
125	2	2	2	2	3	3	3	2	2	2	2	3	2	2	2
150	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1
175	1	1	1	1	2	2	2	2	2	2	2	1	1	1	1
200	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
225	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Table 5 (continuation)

Equivalent dose rate induced by high-energy hadrons from VJ Beam Pipe with Aluminum support structure for T= 10y, t= 1d

R/Z, cm	1300	1310	1325	1360	1400	1440	1500	1560	1620	1680	1740	1800	1840	1855	1865
0	2231														
6	1851	1250													
8	1471	954													
10	966	757	677	463											
15	454	452	381	281	311	280	270	249							
20	277	297	265	207	217	201	188	170	161	157	157	191	279	353	
25	193	212	199	164	167	157	146	132	124	120	119	143	212	287	
50	68	74	77	75	74	72	68	63	59	58	59	72	99	121	
75	38	41	43	45	46	45	43	41	39	38	39	46	50	41	39
100	26	27	28	31	31	31	31	29	28	28	29	31	28	22	21
125	19	20	21	22	23	24	23	23	22	22	22	22	19	15	15
150	15	15	16	17	18	18	18	18	18	18	18	17	14	12	11
175	12	12	13	14	14	15	15	15	15	14	14	13	11	9	9
200	10	10	11	11	12	12	13	12	12	12	12	11	9	8	8
225	8	9	9	9	10	10	11	11	11	10	10	9	7	7	6

Table 5 (continuation)

Equivalent dose rate induced by high-energy hadrons from VJ Beam Pipe with Aluminum support structure for T= 10 y, t=5d

R/Z, cm	1300	1310	1325	1360	1400	1440	1500	1560	1620	1680	1740	1800	1840	1855	1865
0	1630														
6	1352	905													
8	1073	687													
10	703	543	459	303											
15	328	323	264	188	210	188	180	163							
20	199	212	184	140	147	135	126	114	107	104	103	125	185	233	
25	138	150	139	111	113	106	98	89	83	80	79	96	142	189	
50	48	52	54	52	51	49	46	42	40	39	40	48	66	79	
75	27	28	30	31	31	31	29	27	26	26	26	30	33	27	25
100	18	19	20	21	21	21	21	20	19	19	19	21	19	15	14
125	13	14	14	15	16	16	16	15	15	15	15	15	13	10	10
150	10	10	11	12	12	13	13	12	12	12	12	11	9	8	8
175	8	8	9	9	10	10	10	10	10	10	10	9	7	6	6
200	7	7	7	8	8	8	8	8	8	8	8	7	6	5	5
225	6	6	6	6	7	7	7	7	7	7	7	6	5	5	4

Table 5 (continuation)

Equivalent dose rate induced by high-energy hadrons from VJ Beam Pipe with Aluminum support structure for T= 10y, t=100d

R/Z, cm	1300	1310	1325	1360	1400	1440	1500	1560	1620	1680	1740	1800	1840	1855	1865
0	384														
6	320	229													
8	256	179													
10	170	144	163	125											
15	83	88	85	71	76	71	71	67							
20	52	59	58	51	53	50	47	44	42	43	46	62	101	133	
25	37	43	43	39	40	39	36	34	32	32	34	46	78	115	
50	14	16	17	18	18	18	17	16	15	16	17	24	39	51	
75	8	9	10	11	11	11	11	10	10	11	12	16	18	13	13
100	6	6	7	7	8	8	8	8	8	8	9	10	9	6	6
125	4	5	5	5	6	6	6	6	6	6	7	7	6	4	4
150	3	4	4	4	4	5	5	5	5	5	5	5	4	3	3
175	3	3	3	3	4	4	4	4	4	4	4	4	3	2	2
200	2	2	3	3	3	3	3	3	3	4	4	3	2	2	2
225	2	2	2	2	3	3	3	3	3	3	3	3	2	2	2

Table 6

Equivalent dose rate induced by low-energy neutrons from VJ Beam Pipe with Aluminum support structure for T= 100d, t=1d

R/Z, cm	1300	1310	1325	1360	1400	1440	1500	1560	1620	1680	1740	1800	1840	1855	1865
0	41.8														
6	35.1	21.6													
8	28.4	17.1													
10	18.5	13.8	12.6	9.6											
15	8.6	8.4	6.9	5.5	5.8	6.5	7.8	7.8							
20	5.3	5.5	4.9	4.0	4.1	4.6	5.4	5.3	5.7	6.5	8.7	15.9	32.4	48.7	
25	3.7	4.0	3.7	3.2	3.3	3.6	4.2	4.2	4.4	5.1	6.7	12.1	24.9	39.9	
50	1.4	1.5	1.6	1.6	1.6	1.8	2.0	2.1	2.3	2.7	3.7	6.5	11.5	14.7	
75	0.8	0.9	0.9	1.0	1.1	1.2	1.3	1.4	1.6	1.9	2.7	4.2	5.3	4.3	4.2
100	0.6	0.6	0.7	0.7	0.8	0.9	1.0	1.1	1.2	1.5	2.0	2.8	2.8	2.0	1.9
125	0.5	0.5	0.5	0.6	0.6	0.7	0.8	0.9	1.0	1.2	1.5	1.9	1.7	1.2	1.2
150	0.4	0.4	0.4	0.5	0.5	0.6	0.7	0.7	0.8	1.0	1.2	1.4	1.1	0.8	0.8
175	0.3	0.4	0.4	0.4	0.4	0.5	0.6	0.6	0.7	0.8	1.0	1.0	0.8	0.6	0.6
200	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.6	0.7	0.8	0.8	0.6	0.5	0.5
225	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.7	0.6	0.5	0.4	0.4

Table 6 (continuation)

Equivalent dose rate induced by low-energy neutrons from VJ Beam Pipe with Aluminum support structure for T= 100d, t=5d

R/Z, cm	1300	1310	1325	1360	1400	1440	1500	1560	1620	1680	1740	1800	1840	1855	1865
0	38.9														
6	32.6	18.5													
8	26.2	14.2													
10	16.8	11.3	6.5	3.7											
15	7.5	6.6	4.2	2.5	2.6	3.2	4.2	3.8							
20	4.4	4.3	3.1	2.0	2.0	2.3	3.0	2.8	2.9	3.1	3.9	6.3	11.5	16.5	
25	2.9	3.0	2.4	1.6	1.6	1.9	2.3	2.2	2.3	2.5	3.1	5.0	8.8	11.7	
50	0.9	1.0	1.0	0.9	0.8	0.9	1.1	1.1	1.1	1.3	1.6	2.5	3.5	4.0	
75	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.8	0.9	1.1	1.5	1.8	1.7	1.6
100	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.7	0.8	1.0	1.0	1.0	0.9
125	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.7	0.7	0.6	0.6
150	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.5	0.5
175	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4
200	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
225	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2

Table 6 (continuation)

Equivalent dose rate induced by low-energy neutrons from VJ Beam Pipe with Aluminum support structure for T= 100 d, t=100 d

R/Z, cm	1300	1310	1325	1360	1400	1440	1500	1560	1620	1680	1740	1800	1840	1855	1865
0	17.3														
6	14.5	8.3													
8	11.7	6.3													
10	7.5	5.0	2.9	1.7											
15	3.3	3.0	1.9	1.1	1.2	1.4	1.9	1.8							
20	1.9	1.9	1.4	0.9	0.9	1.1	1.4	1.3	1.4	1.5	2.0	3.2	5.5	7.8	
25	1.3	1.3	1.1	0.7	0.7	0.9	1.1	1.0	1.1	1.2	1.6	2.5	4.2	5.3	
50	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.8	1.2	1.5	1.6	
75	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.7	0.8	0.8	0.8
100	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.5	0.5	0.5	0.5
125	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
150	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
175	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2
200	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1
225	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

Table 6 (continuation)

Equivalent dose rate induced by low-energy neutrons from VJ Beam Pipe with Aluminum support structure for T= 10y, t=1d

R/Z, cm	1300	1310	1325	1360	1400	1440	1500	1560	1620	1680	1740	1800	1840	1855	1865
0	58.5														
6	49.2	30.1													
8	39.8	23.6													
10	25.9	19.0	16.1	11.9											
15	12.0	11.5	9.1	7.1	7.6	8.7	10.8	10.9							
20	7.3	7.6	6.5	5.3	5.5	6.2	7.5	7.6	8.4	10.2	14.6	26.1	49.2	71.0	
25	5.1	5.5	5.0	4.2	4.3	4.9	5.9	6.0	6.6	8.1	11.4	20.2	37.6	55.5	
50	1.9	2.0	2.1	2.1	2.2	2.5	2.8	3.1	3.5	4.3	6.1	10.2	16.2	19.8	
75	1.2	1.2	1.3	1.4	1.5	1.6	1.9	2.1	2.4	3.0	4.2	6.3	7.7	6.6	6.4
100	0.8	0.9	0.9	1.0	1.1	1.2	1.4	1.6	1.9	2.3	3.1	4.1	4.3	3.4	3.3
125	0.7	0.7	0.7	0.8	0.9	1.0	1.1	1.3	1.5	1.8	2.3	2.9	2.7	2.1	2.1
150	0.6	0.6	0.6	0.7	0.7	0.8	0.9	1.1	1.3	1.5	1.8	2.1	1.8	1.5	1.5
175	0.5	0.5	0.5	0.6	0.6	0.7	0.8	0.9	1.1	1.3	1.5	1.5	1.3	1.1	1.1
200	0.4	0.4	0.5	0.5	0.6	0.6	0.7	0.8	0.9	1.1	1.2	1.2	1.0	0.9	0.9
225	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.7	0.8	0.9	1.0	1.0	0.8	0.7	0.7

Table 6 (continuation)

Equivalent dose rate induced by low-energy neutrons from VJ Beam Pipe with Aluminum support structure for T= 10 y, t= 5 d

R/Z, cm	1300	1310	1325	1360	1400	1440	1500	1560	1620	1680	1740	1800	1840	1855	1865
0	55.4														
6	46.4	26.9													
8	37.5	20.7													
10	24.1	16.4	10.0	6.0											
15	10.8	9.7	6.4	4.1	4.4	5.3	7.1	6.9							
20	6.4	6.3	4.7	3.2	3.3	3.9	5.1	5.1	5.6	6.8	9.7	16.5	28.2	38.7	
25	4.3	4.4	3.6	2.6	2.6	3.2	4.0	4.1	4.5	5.5	7.8	13.0	21.5	27.3	
50	1.4	1.5	1.5	1.4	1.4	1.6	1.9	2.1	2.3	2.9	4.0	6.1	8.3	9.0	
75	0.8	0.9	0.9	0.9	1.0	1.1	1.3	1.4	1.6	2.0	2.6	3.6	4.2	4.0	3.6
100	0.6	0.6	0.6	0.7	0.7	0.8	0.9	1.0	1.2	1.5	1.9	2.4	2.5	2.3	2.2
125	0.4	0.5	0.5	0.5	0.6	0.6	0.7	0.8	1.0	1.2	1.4	1.7	1.7	1.6	1.5
150	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.7	0.8	0.9	1.1	1.2	1.2	1.1	1.1
175	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.7	0.8	0.9	0.9	0.9	0.9	0.9
200	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.6	0.6	0.7	0.7	0.7	0.7	0.7
225	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.6	0.6	0.6

Table 6 (continuation)

Equivalent dose rate induced by low-energy neutrons from VJ Beam Pipe with Aluminum support structure for T= 10y, t=100d

R/Z, cm	1300	1310	1325	1360	1400	1440	1500	1560	1620	1680	1740	1800	1840	1855	1865
0	30.0														
6	25.2	14.8													
8	20.3	11.4													
10	13.1	9.0	5.8	3.6											
15	5.9	5.4	3.7	2.4	2.7	3.2	4.4	4.4							
20	3.5	3.5	2.7	1.9	2.0	2.4	3.2	3.3	3.8	4.9	7.3	12.5	20.6	27.5	
25	2.4	2.5	2.1	1.6	1.6	2.0	2.5	2.6	3.0	3.9	5.8	9.8	15.5	18.9	
50	0.8	0.9	0.9	0.8	0.9	1.0	1.2	1.4	1.6	2.0	2.9	4.4	5.6	5.7	
75	0.5	0.5	0.5	0.6	0.6	0.7	0.8	0.9	1.1	1.4	1.9	2.6	2.9	2.8	2.7
100	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.7	0.8	1.0	1.3	1.7	1.8	1.7	1.7
125	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.6	0.7	0.8	1.0	1.2	1.2	1.2	1.1
150	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.5	0.5	0.6	0.8	0.9	0.9	0.9	0.8
175	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.5	0.5	0.6	0.7	0.7	0.7	0.6
200	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.5	0.5
225	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4