APPENDIX E

DESIGN BASIS WASTE INPUT RESULTS

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DESIGN BASIS WASTE INPUT RESULTS

This appendix contains detailed waste stream information (chosen from the cases reviewed), that provides the most limiting of all the results. Estimated heat and burnup distributions for the BWR and PWR fuel upon arrival at the MGR are provided in Tables E-1 and E-2. Transportation cask arrivals are displayed in Tables E-3 through E-6.

This data is based on specific fuel selection assumptions. The tables are not based on annual arrival data. The percentage of fuel in a particular heat bin, upon arrival, falls within a burnup range for each fuel type, (e.g., 16 percent of the BWR fuel has a heat of 100-149 watts at the time of arrival, and 7.8 percent of the BWR fuel has a heat of 100-149 watts and falls within the burnup range of 30,000 to 34,999 MWd/MTU at arrival).

Tables E-3 through E-6 display transportation cask arrivals sorted in several different ways. Table E-3 shows the number of transportation casks that may arrive at the MGR receiving facility in any random year, sorting from the year that has the maximum number of legal weight truck casks to the minimum number. Note that this information provides guidance on the frequency at which any specific combination of casks may occur. Tables E-4, E-5, and E-6 display similar information based on sorting by the number of SPC rail casks, DPC rail casks, and the total number of shipments, respectively.

Table E-1. Heat Distribution for BWR Fuel

Heat Range (watts)	Min Burnup (MWd/MTU)	Max Burnup (MWd/MTU)	Percent of Assemblies [a]
0 - 49	0	4,999	1.22
	5,000	9,999	1.34
	10,000	14,999	2.25
	15,000	19,999	0.59
	20,000	24,999	0.17
	25,000	29,999	0.00
Total			**5.57**
50 - 99	5,000	9,999	0.02
	10,000	14,999	3.96
	15,000	19,999	5.09
	20,000	24,999	7.28
	25,000	29,999	7.80
	30,000	34,999	0.42
Total			**24.56**
100 - 149	15,000	19,999	0.26
	20,000	24,999	1.38
	25,000	29,999	4.22
	30,000	34,999	7.77
	35,000	39,999	2.35
Total			**15.98**
150 - 199	20,000	24,999	0.07
	25,000	29,999	1.44
	30,000	34,999	4.68
	35,000	39,999	4.03
	40,000	44,999	0.64
	45,000	49,999	0.05
Total			**10.92**
200 - 249	25,000	29,999	0.09
	30,000	34,999	2.10
	35,000	39,999	4.23
	40,000	44,999	2.02
	45,000	49,999	0.37
	50,000	54,999	0.07
Total			**8.88**

Table E-1. Heat Distribution for BWR Fuel (Continued)

Heat Range (watts)	Min Burnup (MWd/MTU)	Max Burnup (MWd/MTU)	Percent of Assemblies [a]
250 - 299	30,000	34,999	0.15
	35,000	39,999	4.10
	40,000	44,999	3.42
	45,000	49,999	1.83
	50,000	54,999	0.72
	55,000	59,999	0.25
	60,000	64,999	0.03
Total			**10.50**
300 - 349	35,000	39,999	0.99
	40,000	44,999	6.42
	45,000	49,999	4.40
	50,000	54,999	1.16
	55,000	59,999	0.31
	60,000	64,999	0.05
	65,000	69,999	0.01
Total			**13.33**
350 - 399	30,000	34,999	0.01
	35,000	39,999	0.06
	40,000	44,999	0.55
	45,000	49,999	2.85
	50,000	54,999	3.06
	55,000	59,999	1.17
	60,000	64,999	0.41
	65,000	69,999	0.01
Total			**8.12**
400 - 449	35,000	39,999	0.05
	40,000	44,999	0.16
	45,000	49,999	0.37
	50,000	54,999	0.36
	55,000	59,999	0.24
	60,000	64,999	0.11
	65,000	69,999	0.13
Total			**1.42**

Table E-1. Heat Distribution for BWR Fuel (Continued)

Heat Range (watts)	Min Burnup (MWd/MTU)	Max Burnup (MWd/MTU)	Percent of Assemblies [a]
450 - 499	35,000	39,999	0.10
	40,000	44,999	0.09
	45,000	49,999	0.11
	50,000	54,999	0.20
	55,000	59,999	0.06
Total			**0.55**
500 - 549	40,000	44,999	0.02
	45,000	49,999	0.05
	50,000	54,999	0.05
	55,000	59,999	0.06
	60,000	64,999	0.01
Total			**0.18**
Grand Total			**100.00**

Note: [a] Column may not add to 100 percent due to rounding.
[b] Based on Origin 2 Heat Code.

Table E-2. Heat Distribution for PWR Fuel

Heat Range (watts)	Min Burnup (MWd/MTU)	Max Burnup (MWd/MTU)	Percent of Assemblies [b]
0 - 99	0	4,999	0.03
	5,000	9,999	0.20
	10,000	14,999	0.59
	15,000	19,999	0.08
	20,000	24,999	0.06
	25,000	29,999	0.04
Total			**1.01**
100 - 199	10,000	14,999	0.83
	15,000	19,999	2.72
	20,000	24,999	1.62
	25,000	29,999	2.46
	30,000	34,999	0.64
	45,000	49,999	0.00
Total			**8.26**
200 - 299	10,000	14,999	0.13
	15,000	19,999	1.67
	20,000	24,999	0.71
	25,000	29,999	3.31
	30,000	34,999	7.15
	35,000	39,999	4.41
	40,000	44,999	0.54
	45,000	49,999	0.00
Total			**17.92**
300 - 399	10,000	14,999	0.01
	15,000	19,999	0.39
	20,000	24,999	0.33
	25,000	29,999	0.29
	30,000	34,999	1.87
	35,000	39,999	6.28
	40,000	44,999	4.68
	45,000	49,999	0.96
	50,000	54,999	0.00
Total			**14.81**

Table E-2. Heat Distribution for PWR Fuel (Continued)

Heat Range (watts)	Min Burnup (MWd/MTU)	Max Burnup (MWd/MTU)	Percent of Assemblies [b]
400 - 499	15,000	19,999	0.08
	20,000	24,999	0.06
	25,000	29,999	0.09
	30,000	34,999	0.64
	35,000	39,999	1.88
	40,000	44,999	3.69
	45,000	49,999	1.96
	50,000	54,999	0.37
	55,000	59,999	0.03
Total			**8.80**
500 - 599	20,000	24,999	0.02
	25,000	29,999	0.04
	30,000	34,999	0.22
	35,000	39,999	1.50
	40,000	44,999	2.83
	45,000	49,999	2.56
	50,000	54,999	0.61
	55,000	59,999	0.11
	60,000	64,999	0.02
Total			**7.91**
600 - 699	25,000	29,999	0.01
	30,000	34,999	0.13
	35,000	39,999	0.57
	40,000	44,999	2.38
	45,000	49,999	2.92
	50,000	54,999	1.30
	55,000	59,999	0.24
	60,000	64,999	0.02
Total			**7.57**
700 - 799	25,000	29,999	0.00
	30,000	34,999	0.05
	35,000	39,999	0.23
	40,000	44,999	1.60
	45,000	49,999	3.55
	50,000	54,999	2.39
	55,000	59,999	0.72

Table E-2. Heat Distribution for PWR Fuel (Continued)

Heat Range (watts)	Min Burnup (MWd/MTU)	Max Burnup (MWd/MTU)	Percent of Assemblies [b]
700 - 799	60,000	64,999	0.08
	65,000	69,999	0.01
Total			**8.61**
800 - 999	30,000	34,999	0.02
	35,000	39,999	0.14
	40,000	44,999	0.49
	45,000	49,999	2.71
	50,000	54,999	6.09
	55,000	59,999	3.72
	60,000	64,999	1.06
	65,000	69,999	0.05
Total			**14.27**
1000 - 1199	35,000	39,999	0.03
	40,000	44,999	0.09
	45,000	49,999	0.34
	50,000	54,999	0.87
	55,000	59,999	2.50
	60,000	64,999	2.41
	65,000	69,999	0.31
Total			**6.54**
1200 - 1399	40,000	44,999	0.01
	45,000	49,999	0.07
	50,000	54,999	0.19
	55,000	59,999	0.37
	60,000	64,999	0.78
	65,000	69,999	0.53
	70,000	74,999	0.02
Total			**1.97**
1400 - 1599	50,000	54,999	0.04
	55,000	59,999	0.13
	60,000	64,999	0.30
	65,000	69,999	0.06
	70,000	74,999	0.02
Total			**0.55**

Table E-2. Heat Distribution for PWR Fuel (Continued)

Heat Range (watts)	Min Burnup (MWd/MTU)	Max Burnup (MWd/MTU)	Percent of Assemblies [b]
1600 - 1799	50,000	54,999	0.01
	55,000	59,999	0.03
	60,000	64,999	0.16
	65,000	69,999	0.03
	70,000	74,999	0.00
Total			**0.24**
1800 - 1999	60,000	64,999	0.02
	65,000	69,999	0.08
Total			**0.10**
MOX [a]	15,000	19,999	0.04
	20,000	24,999	0.08
	30,000	34,999	0.01
	35,000	39,999	0.02
	40,000	44,999	0.42
	45,000	49,999	0.40
	50,000	54,999	0.25
	55,000	59,999	0.14
	60,000	64,999	0.07
	65,000	69,999	0.01
Total			**1.44**
Grand Total			**100.00**

NOTE: [a] Heat is not calculated for MOX fuel.
[b] Column may not add to 100 percent due to rounding.
[c] Based on Origin 2 Heat Code.

Table E-3. Design Basis CSNF Shipment Arrivals - Sorted by Truck Cask Arrivals

	Truck [a]	UCF Rail [a]	DPC Rail [a]	Total [a]
	230	350	40	620
	220	340	40	580
	180	210	40	420
	150	380	40	560
	120	380	40	540
	100	380	50	530
	100	140	20	250
	90	340	70	490
	70	380	50	490
	60	80	20	140
	50	290	110	430
	40	330	90	450
	40	360	80	460
	30	40	20	80
	30	330	80	430
	30	310	100	430
	30	300	110	430
	30	350	80	450
	0	330	90	410
	0	240	150	380
	0	230	140	370
	0	220	160	380
	0	140	210	340
	0	110	220	330
	0	100	240	340
	0	70	240	310
	0	60	260	320
	0	50	250	300
	0	60	250	310
	0	30	260	290
	0	40	140	170
	0	0	0	0
Total	**1,510**	**6,840**	**3,550**	**11,900**
Maximum	**230**	**380**	**260**	**620**

NOTE: [a] Numbers have been rounded up to the nearest 10 casks.
[b] Totals do not add due to rounding.

Table E-4. Design Basis CSNF Shipment Arrivals - Sorted by SPC Rail Cask Arrivals

	Truck [a]	UCF Rail [a]	DPC Rail [a]	Total [a]
	150	380	40	560
	120	380	40	540
	100	380	50	530
	70	380	50	490
	40	360	80	460
	230	350	40	620
	30	350	80	450
	90	340	70	490
	220	340	40	580
	40	330	90	450
	30	330	80	430
	0	330	90	410
	30	310	100	430
	30	300	110	430
	50	290	110	430
	0	240	150	380
	0	230	140	370
	0	220	160	380
	180	210	40	420
	100	140	20	250
	0	140	210	340
	0	110	220	330
	0	100	240	340
	60	80	20	140
	0	70	240	310
	0	60	260	320
	0	60	250	310
	0	50	250	300
	30	40	20	80
	0	40	140	170
	0	30	260	290
	0	0	0	0
Total	**1,510**	**6,840**	**3,550**	**11,900**
Maximum	**230**	**380**	**260**	**620**

NOTE: [a] Numbers have been rounded up to the nearest 10 casks.
[b] Totals do not add due to rounding.

Table E-5. Design Basis CSNF Shipment Arrivals - Sorted by DPC Rail Cask Arrivals

	Truck [a]	UCF Rail [a]	DPC Rail [a]	Total [a]
	0	60	260	320
	0	30	260	290
	0	60	250	310
	0	50	250	300
	0	70	240	310
	0	100	240	340
	0	110	220	330
	0	140	210	340
	0	220	160	380
	0	240	150	380
	0	230	140	370
	0	40	140	170
	30	300	110	430
	50	290	110	430
	30	310	100	430
	40	330	90	450
	0	330	90	410
	30	330	80	430
	30	350	80	450
	40	360	80	460
	90	340	70	490
	100	380	50	530
	70	380	50	490
	180	210	40	420
	230	350	40	620
	120	380	40	540
	220	340	40	580
	150	380	40	560
	100	140	20	250
	30	40	20	80
	60	80	20	140
	0	0	0	0
Total	**1,510**	**6,840**	**3,550**	**11,900**
Maximum	**230**	**380**	**260**	**620**

NOTE: [a] Numbers have been rounded up to the nearest 10 casks.
[b] Totals do not add due to rounding.

Table E-6. Design Basis CSNF Shipment Arrivals - Sorted by Total Cask Arrivals

	Truck [a]	UCF Rail [a]	DPC Rail [a]	Total [a]
	230	350	40	620
	220	340	40	580
	150	380	40	560
	120	380	40	540
	100	380	50	530
	90	340	70	490
	70	380	50	490
	40	360	80	460
	40	330	90	450
	30	350	80	450
	30	330	80	430
	50	290	110	430
	30	300	110	430
	30	310	100	430
	180	210	40	420
	0	330	90	410
	0	240	150	380
	0	220	160	380
	0	230	140	370
	0	140	210	340
	0	100	240	340
	0	110	220	330
	0	60	260	320
	0	70	240	310
	0	60	250	310
	0	50	250	300
	0	30	260	290
	100	140	20	250
	0	40	140	170
	60	80	20	140
	30	40	20	80
	0	0	0	0
Total	**1,510**	**6,840**	**3,550**	**11,900**
Maximum	**230**	**380**	**260**	**620**

NOTE: [a] Numbers have been rounded up to the nearest 10 casks.
[b] Totals do not add due to rounding.