APPENDIX C

CONTAINMENT CALCULATIONS

Veolia ES Technical Solutions
5736 West Jefferson Street
Phoenix, Arizona
Summary Table - Storage Capacity Calculations for Compliance with 40 CFR 761.65 b(1)(ii)

Storage Area Identification	Area Use	Location	Containers Stored	Maximum Totes/Boxes	Maximum Volume Totes/Boxes	Maximum Drums	Maximum Volume Drums	Maximum Storage Capacity (gallons)	Comments
POD + Curbed	PCB Storage	Inside Building 2	Drums, Totes, Cubic Yard Boxes, Bins, or Equipment Storage	36.00	12,600.00	192.00	10,560.00	12,600.00	
Building 3	PCB Storage	Inside Building 3	Drums, Bins, Cubic Yard Boxes, Totes, or Equipment Storage	132.00	46,200.00	768.00	42,240.00	46,200.00	
Building 4 POD	PCB Storage	Inside Building 4	Drums, Bins, or Cubic Yard Box Storage	16.00	3,232.00	32.00	1,760.00	3,232.00	
								62,032.00	Design PCB Storage Capacity in Gallons
								307	Design PCB Storage Capacity in Cubic Yards

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Table 1 - POD Storage Capacity Calculations Inside Buildings for 350 Gallon Tote* Storage for Compliance with 40 CFR 761.65 b(1)(ii)

Area Use	Location	Containers Stored	Length (ft)	Width (ft)	Height (ft)	Vsto[1] (ft^3)	Vsto[2] (gal)	$V_{Largest}$[3] (gal)	n_{max1}[4]	n_{max2}[5]	$V_{Displaced}$[6] (gal)	V_{R1}[7] (gal)	V_{R2}[8] (gal)	$V_{Required}$[9] (gal)	V_{Actual}[10] (gal)	V_{Pod} Complies With 40 CFR 761.65 b(1)(ii) based on n_{max}	$n_{allowed}$	Comments
PCB Storage	Inside Building 2 POD	Totes, Electrical Equipment	72.33	10.33	0.83	622.87	4,659.07	350.00	12.00	24.00	1992.67	700.00	2,100.00	2,100.00	2,666.40	Yes	24.00	Maximum tote storage is based on tote and aisle size.
PCB Storage	Inside Building 2 Curbed, Sealed, Concrete	Totes	19.75	24.583	0.625	303.45	2,269.78	350.00	6.00	12.00	747.25	700.00	1,050.00	1,050.00	1,522.53	Yes	12.00	Maximum tote storage is based on tote and aisle size.
PCB Storage	Inside Building 3; Area A	Totes, Electrical Equipment	59.42	46.17	0.50	1371.63	10,259.82	350.00	45.00	90.00								This row is used only to calculate the maximum number of totess, n_{max2}, that can be stored based on tote size and required aisle space. The actual number of totes that can be stored based on containment volume are calculated for Building 3 as a whole below.
PCB Storage	Inside Building 3; Area B	Totes, Electrical Equipment	57.08	23.67	0.50	675.54	5,053.05	350.00	18.00	36.00								This row is used only to calculate the maximum number of totes, n_{max2}, that can be stored based on tote size and required aisle space. The actual number of totes that can be stored based on containment volume are calculated for Building 3 as a whole below.
PCB Storage	Inside Building 3; Area C	Totes, Electrical Equipment	20.50	7.50	0.50	76.88	575.03	350.00	3.00	3.00								This row is used only to calculate the maximum number of totes, n_{max2}, that can be stored based on tote size and required aisle space. The actual number of totes that can be stored based on containment volume are calculated for Building 3 as a whole below.
PCB Storage	Inside Building 3; Area D	Totes, Electrical Equipment	22.92	6.50	0.50	74.49	557.19	350.00	3.00	3.00								This row is used only to calculate the maximum number of totes, n_{max2}, that can be stored based on tote size and required aisle space. The actual number of totes that can be stored based on containment volume are calculated for Building 3 as a whole below.
PCB Storage	Inside Building 3	Totes, Electrical Equipment	Total Containment for Irregular-Shaped Curbed Area of 5,431.75 ft2 including Processing and Storage		0.50	2715.88	20,314.75	350.00	NA	132.00	6575.82	700.00	11,550.00	11,550.00	13,738.93	Yes	132.00	Maximum tote storage is based on tote and aisle size and is not limited by containment volume.
PCB Storage	Inside Building 4 POD	Cubic Yard Boxes[11], Electrical Equipment	28.16	8.66	0.83	202.41	1,514.02	202.00	4.00	16.00	661.57	404.00	808.00	808.00	852.45	Yes	16.00	Maximum cubic yard box storage is based on pallet and aisle size and double-stacking.

*Totes are 40" x 48" (3.33' x 4') and 53" in height; the tote dimensions also represent the approx. size, shape, and displacement associated with small to medium-sized electrical equipment such as polemount transformers, capacitors, etc.
Aisle Space required between each tote assumed to be 2 ft

Cubic yard boxes in Building 4 are stored on pallets that are 40" X 48" (3.33' x 4"), the same dimensions as the 350-gallon tote. The boxes are 3' in height.

Notes:
1. V_{pod} = Volume of the Pod (ft^3) = Length (ft) * Width (ft) * Height (ft)
2. V_{pod} (gal) = Vpod (ft^3) * 7.48 (gal/ft^3)
3. $V_{Largest}$ (gal) = Volume of the largest tote that is typically stored at Veolia = 350 gallons (Volume of cubic yard boxes is 202 gallons.)
4. n_{max1} = Maximum number of totes/cubic yard boxes that can be stored (back-to-back) in the Pod based on the Pod dimensions and the required aisle space = (Length of Pod (ft) / [(Length of Tote (ft) + Aisle Space (ft)]) * (Width of Pod (ft) / [2 x Width of Tote (ft) + Aisle Space (ft)])
5. n_{max2} = n_{max}1 multiplied by a factor of 2 to account for the doubled tote/pallet width used in Column K (6.66 feet rather than 3.33 feet); this value is then rounded down to nearest whole number
6. $V_{Displaced}$ (gal) = n_{max2} * (Tote L x Tote W x Pod berm height) x 7.48 gal/cu.ft.
7. V_{R1} (gal) = 40 CFR 761.65 b(1)(ii) containment requirement of two times the largest container = $V_{Largest}$ (gal) * 2
8. V_{R2} (gal) = 40 CFR 761.65 b(1)(ii) containment requirement of 25% of the total internal volume of all containers = $V_{Largest}$ (gal) * n_{max2} * 25%
9. $V_{Required}$ (gal) is either V_{R1} or V_{R2} (whichever is larger)
10. V_{Actual} (gal) = V_{Pod} (gal) - $V_{Displaced}$ (gal)
11. Number of cubic yard boxes that can fit in the pod is based on the size of the pallet on which the box sits. The pallet is assumed to displace fluid, a conservative assumption. Boxes are assumed to be stacked two-high in determining total volume of storage.

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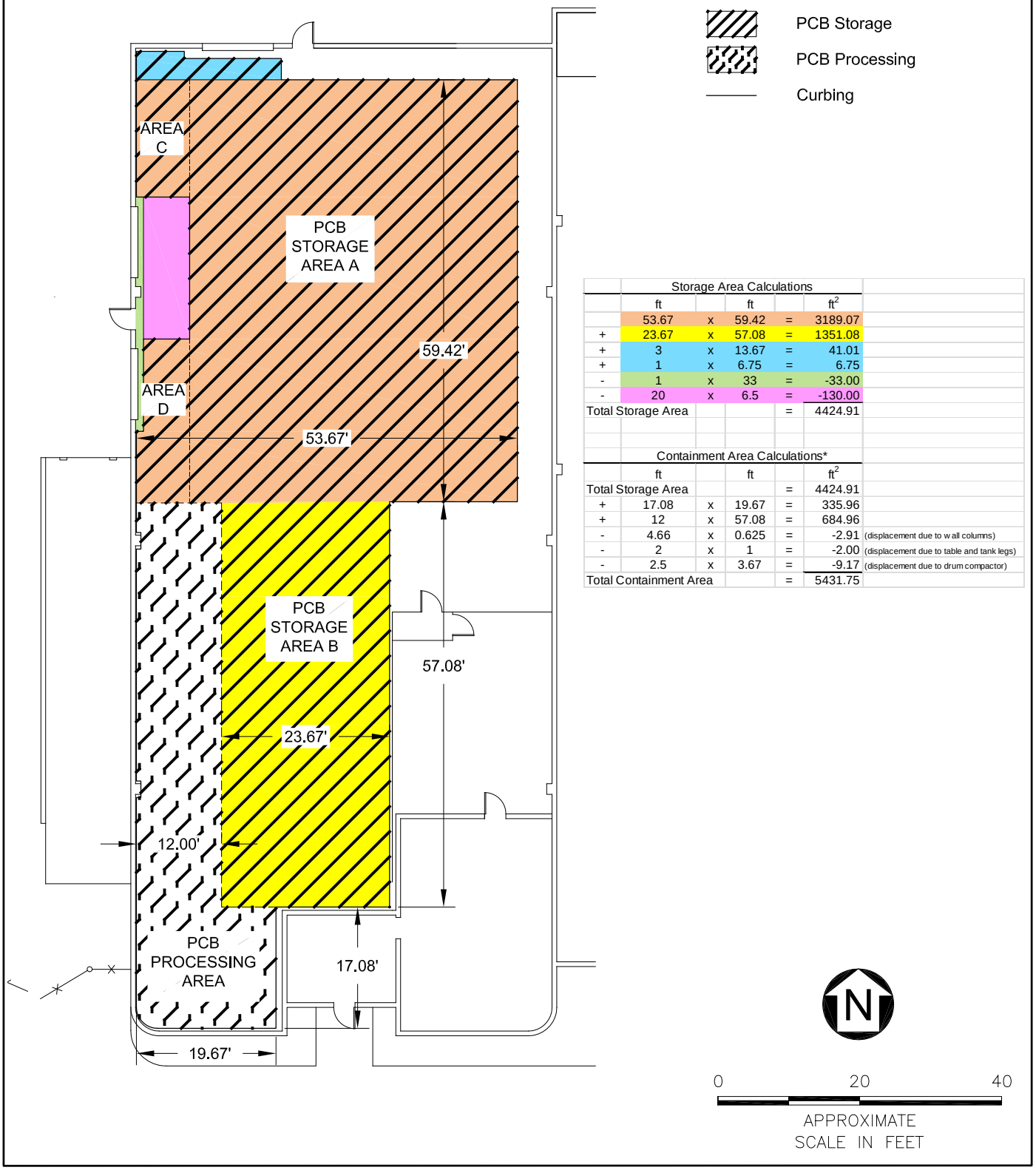
Table 2 - POD Storage Capacity Calculations for 55 Gallon Drum Storage for Compliance with 40 CFR 761.65(b)(1)(ii)

Area Use	Location	Containers Stored	Length (ft)	Width (ft)	Height (ft)	Vsto[1] (ft^3)	Vsto[2] (gal)	$V_{Largest}$[3] (gal)	n_{max1}[4]	n_{max2}[5]	$V_{Displaced}$[6] (gal)	V_{R1}[7] (gal)	V_{R2}[8] (gal)	$V_{Required}$[9] (gal)	V_{Actual}[10] (gal)	V_{Pod} Complies With 40 CFR 761.65 b(1)(ii) based on n_{max}	$n_{allowed}$	Comments
PCB Storage	Inside Building 2 POD	Drums, Electrical Equipment, Debris	72.33	10.33	0.83	622.87	4,659.07	55.00	12.00	48.00	939.49	110.00	1,320.00	1,320.00	3,719.58	Yes	96.00	Maximum drum storage is based on drum and aisle size.
PCB Storage	Inside Building 2 Bermed, Sealed, Concrete	Drums	19.75	24.583	0.625	303.45	2,269.78	55.00	12.00	48.00	704.62	110.00	1,320.00	1,320.00	1,565.16	Yes	96.00	Maximum drum storage is based on drum and aisle size.
PCB Storage	Inside Building 3; Area A	Drums, Debris	59.42	46.17	0.50	1371.63	10,259.82	55.00	63.00	252.00								This row is used only to calculate the maximum number of drums, n_{max2}, that can be stored based on drum size and required aisle space. The actual number of drums that can be stored based on containment volume are calculated for Building 3 as a whole below.
PCB Storage	Inside Building 3; Area B	Drums, Debris	57.08	23.67	0.50	675.54	5,053.05	55.00	27.00	108.00								This row is used only to calculate the maximum number of drums, n_{max2}, that can be stored based on drum size and required aisle space. The actual number ofdrums that can be stored based on containment volume are calculated for Building 3 as a whole below.
PCB Storage	Inside Building 3; Area C	Drums, Debris	20.50	7.50	0.50	76.88	575.03	55.00	3.00	12.00								This row is used only to calculate the maximum number of drums, n_{max2}, that can be stored based on drum size and required aisle space. The actual number ofdrums that can be stored based on containment volume are calculated for Building 3 as a whole below.
PCB Storage	Inside Building 3; Area D	Drums, Debris	22.92	6.50	0.50	74.49	557.19	55.00	3.00	12.00								This row is used only to calculate the maximum number of drums, n_{max2}, that can be stored based on drum size and required aisle space. The actual number ofdrums that can be stored based on containment volume are calculated for Building 3 as a whole below.
PCB Storage	Inside Building 3	Drums, Debris	Total Containment for Irregular-Shaped Curbed Area of 5,431.75 ft^2 including processing and storage		0.50	2715.88	20,314.75	55.00	96.00	384.00	4509.54	110.00	10,560.00	10,560.00	15,805.20	Yes	768.00	Maximum drum storage is based on drum and aisle size and is not limited by containment volume.
PCB Storage	Inside Building 4	Drums, Debris	28.16	8.66	0.83	202.41	1,514.02	55.00	4.00	16.00	311.91	110.00	440.00	440.00	1,202.11	Yes	32.00	Maximum drum storage is based on drum and aisle size.

Drums are 24" diameter and 35" high
Aisle Space required between each drum assumed to be 2 ft

Notes:

1. V_{pod} = Volume of the Pod (ft^3) = Length (ft) * Width (ft) * Height (ft)
2. V_{pod} (gal) = Vpod (ft^3) * 7.48 (gal/ft^3)
3. $V_{Largest}$ (gal) = Volume of the largest drum that is typically stored at Veolia = 55 gallons
4. n_{max1} = Maximum number of 55 gallon drums that can be stored in the Pod based on the Pod dimensions and the required aisle space = [Length of Pod / (2 x diameter of 2 drums + Aisle Space)] * [Width of Pod / (2 x diameter of 2 drums + Aisle Space)]; this calculation includes a 4-drum unit configuration (drums stored together in groups of four with no interceding aisle space).
5. n_{max2} = n_{max1} x 4 to account for the 4 unit placement configuration used in Column K
6. $V_{Displaced}$ (gal) = n_{max2} * [(3.14* (rad^2)* height of berm)].
7. V_{R1} (gal) = 40 CFR 761.65 b(1)(ii) containment requirement of two times the largest container = $V_{Largest}$ (gal) * 2
8. V_{R2} (gal) = 40 CFR 761.65 b(1)(ii) containment requirement of 25% of the total internal volume of all containers = $V_{Largest}$ (gal) * n_{max2} * 25%
9. $V_{Required}$ (gal) is either V_{R1} or V_{R2} (whichever is larger)
10. V_{Actual} (gal) = V_{Pod} (gal) - $V_{Displaced}$ (gal)



Storage Area Calculations						
	ft		ft		ft^2	
	53.67	x	59.42	=	3189.07	
+	23.67	x	57.08	=	1351.08	
+	3	x	13.67	=	41.01	
+	1	x	6.75	=	6.75	
-	1	x	33	=	-33.00	
-	20	x	6.5	=	-130.00	
Total Storage Area				=	4424.91	

Containment Area Calculations*						
	ft		ft		ft^2	
Total Storage Area				=	4424.91	
+	17.08	x	19.67	=	335.96	
+	12	x	57.08	=	684.96	
-	4.66	x	0.625	=	-2.91	(displacement due to w all columns)
-	2	x	1	=	-2.00	(displacement due to table and tank legs)
-	2.5	x	3.67	=	-9.17	(displacement due to drum compactor)
Total Containment Area				=	5431.75	

Building 3 - Storage Area and Containment Area Calculations

Veolia ES Technology Solutions, LLC

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Figure C-1

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