

## Appendix L

### Additional Criteria for Dam Systems

#### **1. Applicability**

This appendix contains the four criteria referenced in this Volume, subsection 8.4.5, *Dam Systems*. These criteria apply to proposed construction of new dams and alteration of existing dams, as defined in paragraph 2.0(a)(23) in this Volume. These criteria do not apply to a levee or levee system, as defined in paragraphs 2.0(a)(66) and (67), respectively, in this Volume. The four criteria require: 1) providing dam system information, 2) establishing a downstream hazard potential, 3) developing an Emergency Action Plan for a potentially hazardous dam, and 4) conducting a Condition Assessment for an existing dam that is potentially hazardous. These criteria and their requirements are described in detail below.

Applicants with such dam projects shall provide the required information to the permitting agency in the application submittal, and electronically submit this information to the Department at [DamSafety@FloridaDEP.gov](mailto:DamSafety@FloridaDEP.gov). Applicants are encouraged to contact the permitting agency to request a pre-application meeting to discuss the applicability of these criteria and best approaches to meet the requirements for their specific dam project.

#### **2. Dam System Information**

Form 62-330.301(25), “Dam System Information” shall be completed in accordance with the instructions on the form. This information will be maintained by the Department to provide a repository for these systems, and for dissemination where needed in the event of an emergency situation.

#### **3. Downstream Hazard Potential**

A downstream hazard potential shall be determined for each dam based on the probable adverse consequences to human life, and economic, environmental, and lifeline interests, and other concerns, such as water quality degradation, should the dam or appurtenant structures fail (e.g., breach) or are mis-operated (e.g., unscheduled release). Importantly, the downstream hazard potential does not reflect the current safety, structural integrity, or flood routing capacity of a dam and its appurtenant structures. Also, the downstream hazard potential may change over time (typically, it will increase as the downstream area is developed). Lastly, for dams in series, each upstream dam shall have a downstream hazard potential equal to or greater than the next downstream dam.

##### (1) Classification

The downstream hazard potential may be classified as one of the three categories described below.

- a) High Hazard Potential (HHP) – Failure or mis-operation of the dam will probably cause the loss of human life. Economic, environmental, and lifeline losses may also occur, but they are not necessary for this classification.
- b) Significant Hazard Potential (SHP) – Failure or mis-operation would not be expected to probably result in loss of human life, but can cause economic loss, environmental damage, disruption of lifeline facilities, or impact other concerns, such as water quality.
- c) Low Hazard Potential (LHP) – Failure or mis-operation is not expected to result in loss of human life and may result in low economic and/or environmental losses, that are largely limited to the owner’s property.

The table below shows the expected consequences for each downstream hazard potential.

<b>Downstream Hazard Potential</b>	<b>Loss of Human Life</b>	<b>Economic, Environmental, &amp; Lifeline Losses</b>
<u>High</u>	Probable	Yes, but not necessary
<u>Significant</u>	None expected	Yes
<u>Low</u>	None expected	Low and generally limited to owner's property

(2) Evaluation

For each dam, the applicant shall provide the downstream hazard potential and supporting information for its determination that is developed in a manner consistent with the following methodologies:

- a) Obvious LHP dams – The Photo-Based Mapping method may be used to provide inundation maps without an engineering analysis for small- and intermediate-sized dams with no downstream structures and roads at or below the elevation of the dam crest within the expected inundation area. Refer to *The Florida Emergency Action Plan Template Instruction Manual* (DEP 2022) on how to use Photo-Based Mapping to estimate conservative flood areas. Submit an aerial map(s), elevation contour or digital elevation map(s), field survey (if available), dam geometry, reservoir capacity, locations and types of downstream structures, a depiction of the anticipated flood extent and a discussion of the expected consequences and downstream hazard potential. The maps must be at legible scales to see structures and details. This LHP classification and supporting information do not need to be certified by a registered professional.
- b) Possible LHP dams – A Simplified Engineering Analysis may be used where there are few structures or roads below the dam crest and the downstream terrain is relatively flat and constant. The methodology to perform a Simplified Engineering Analysis is described in *Florida Emergency Action Plan Template Instruction Manual* DEP 2022 or current version). Submit a report, including an aerial map(s), elevation contour or digital elevation map(s), field survey (if available), dam and downstream geometry, reservoir capacity, locations and types of downstream structures, engineering calculations, and inundation maps, and evacuation maps, including peak flood wave depth, peak flood wave stage, and peak flood wave arrival times at the locations of interested downstream of the dam, a discussion of the study input and output parameters and expected consequences, and the downstream hazard potential. A registered professional must certify the Simplified Engineering Analysis and resulting downstream hazard potential classification.
- c) SHP and HHP dams. For dams that do not fit the descriptions above, the downstream hazard potential shall be determined through inundation studies performed using two-dimensional computer modeling, preferably HEC-RAS 2D, version 6, or equivalent. The inundation report, including inundation maps for an Emergency Action Plan, shall meet the *Federal Guidelines for Inundation Mapping of Flood Risks Associated with Dam Incidents and Failures* (FEMA P-946), dated July 2013. The downstream hazard potential shall be stated in the inundation report and certified by a registered professional qualified in the evaluation of dam systems.

**4. Emergency Action Plan**

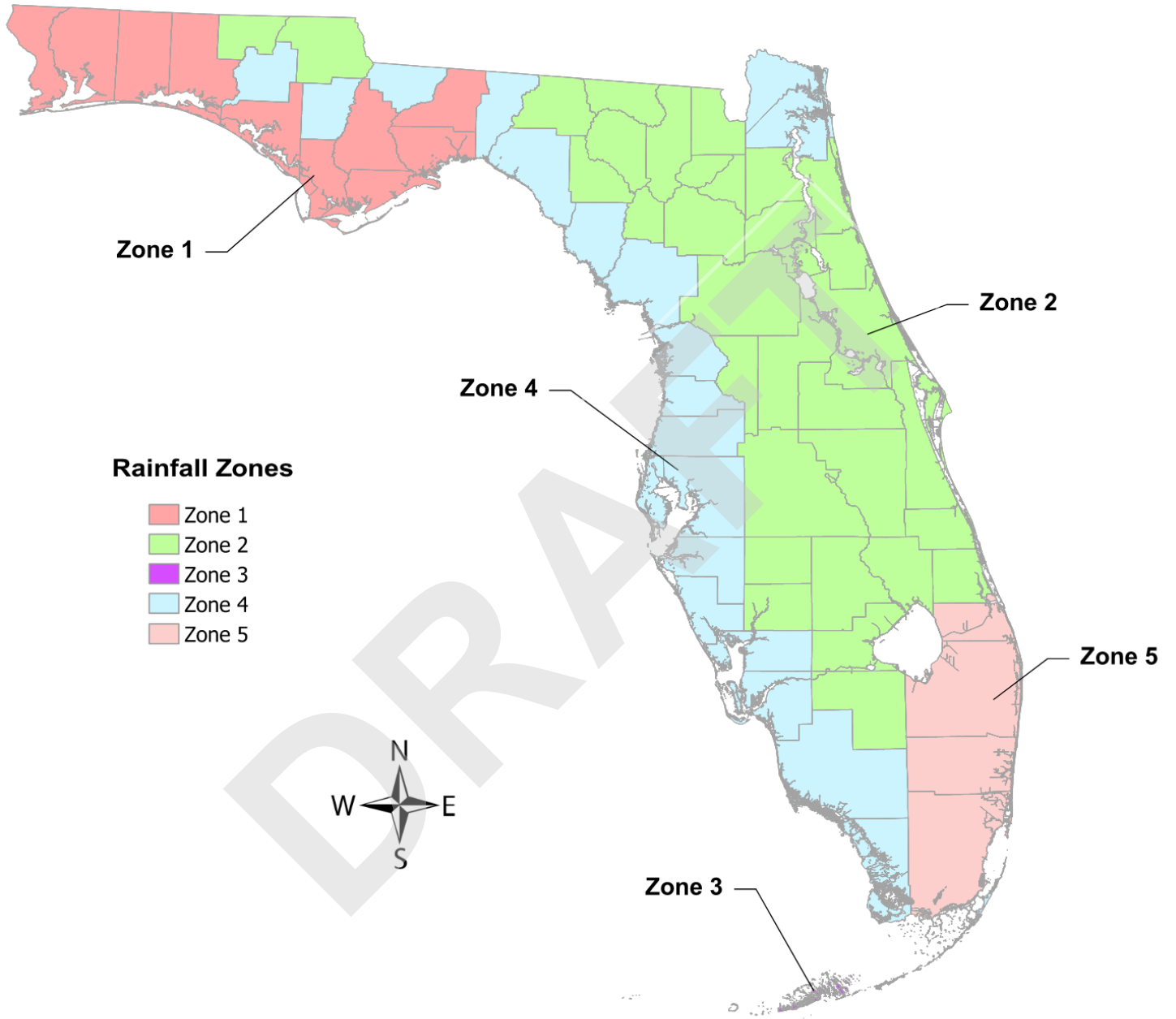
An emergency action plan (EAP) shall be developed for each SHP and HHP dam. The EAP may include multiple dams that are owned by the same owner(s), if they are in close proximity with one another or in succession. An EAP provides the dam owner, the dam owner's engineer, emergency management officials, and other personnel and responders with clear instructions to take should an anomalous or emergency condition develop at a dam. Florida has an EAP template, *The Emergency Action Plan Template for Florida Dams*, and accompanying manual, *Florida Emergency Action Plan Template Instruction Manual*, to

simplify EAP development. The EAP template characterizes abnormal occurrences into three types of events: Unusual (a slowly developing event), Watch (a rapidly developing event), and Warning (an imminent or ongoing dam failure). Evacuation maps are an important component of the EAP and shall be included in the plans. The template may be modified to fit different circumstances, such as activating an alert system, including cascading dam failures, and multiple owners. Use of another emergency plan is acceptable if it provides similar information and is approved by the permitting agency.

## **5. Condition Assessment**

A condition assessment report (CAR) shall be provided for each existing SHP and HHP dam. The CAR shall include the most recent aboveground and underwater inspection results and supporting reports, including available pictures and videos, that were performed within the last five years. A *Condition Assessment Report for Florida Dams* guidance form is available for use or reference on the Florida Dam Safety Program website. The CAR shall include assessments of the crest, upstream and downstream slopes, plunge pool, principle and emergency spillways, instrumentation, outlet pipe(s), stilling basin, waterbody structures, downstream hazard issues, available drawings, pictures, and underwater video. The overall condition assessment of each dam shall be designated as Satisfactory, Fair, Poor, or Unsatisfactory, as defined in the guidance form, and certified by a registered professional qualified in the evaluation of dam systems.

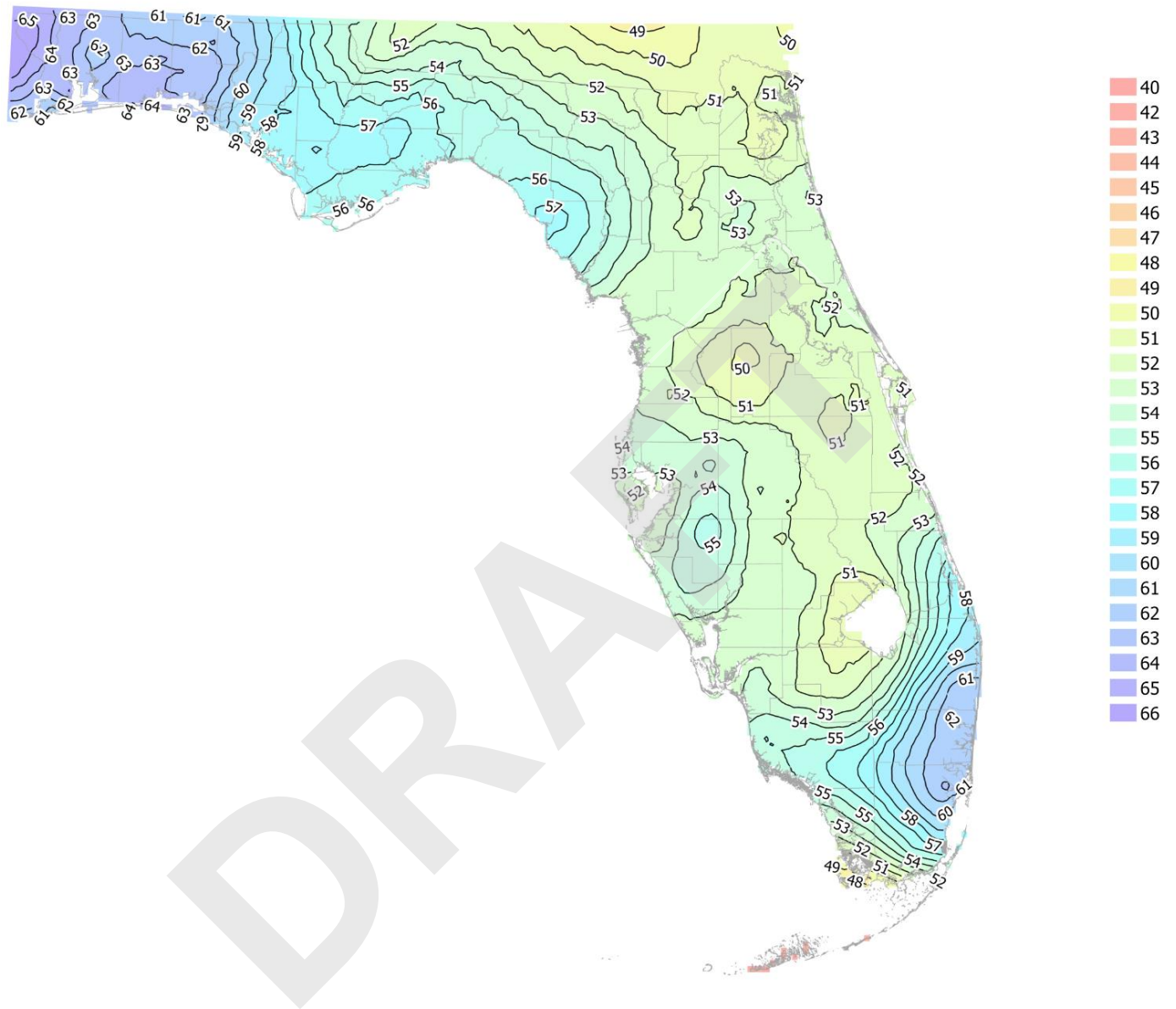
**Appendix M**  
**Rainfall Criteria**



**Figure 1: Designated Meteorological Regions (Zones) in Florida**

**Table 1: Counties Included in the Designated Meteorological Zones**

<b><u>ZONE 1</u></b>	<b><u>ZONE 2</u></b>	<b><u>ZONE 3</u></b>	<b><u>ZONE 4</u></b>	<b><u>ZONE 5</u></b>
<b><u>Bay</u></b>	<b><u>Alachua</u></b>	<b><u>Monroe County -</u></b>	<b><u>Charlotte</u></b>	<b><u>Broward</u></b>
<b><u>Escambia</u></b>	<b><u>Baker</u></b>	<b><u>Florida Keys from</u></b>	<b><u>Citrus</u></b>	<b><u>Miami-Dade</u></b>
<b><u>Franklin</u></b>	<b><u>Bradford</u></b>	<b><u>Key Largo to Key</u></b>	<b><u>Collier</u></b>	<b><u>Martin</u></b>
<b><u>Gulf</u></b>	<b><u>Brevard</u></b>	<b><u>West</u></b>	<b><u>Dixie</u></b>	<b><u>Palm Beach</u></b>
<b><u>Leon</u></b>	<b><u>Calhoun</u></b>		<b><u>Duval</u></b>	
<b><u>Liberty</u></b>	<b><u>Clay</u></b>		<b><u>Hernando</u></b>	
<b><u>Okaloosa</u></b>	<b><u>Columbia</u></b>		<b><u>Hillsborough</u></b>	
<b><u>Santa Rosa</u></b>	<b><u>Desoto</u></b>		<b><u>Jefferson</u></b>	
<b><u>Wakulla</u></b>	<b><u>Flagler</u></b>		<b><u>Lee</u></b>	
<b><u>Walton</u></b>	<b><u>Gadsden</u></b>		<b><u>Levy</u></b>	
	<b><u>Gilchrist</u></b>		<b><u>Manatee</u></b>	
	<b><u>Glades</u></b>		<b><u>Mainland Monroe</u></b>	
	<b><u>Hamilton</u></b>		<b><u>Nassau</u></b>	
	<b><u>Hardee</u></b>		<b><u>Pasco</u></b>	
	<b><u>Hendry</u></b>		<b><u>Pinellas</u></b>	
	<b><u>Highlands</u></b>		<b><u>Sarasota</u></b>	
	<b><u>Holmes</u></b>		<b><u>Taylor</u></b>	
	<b><u>Indian River</u></b>		<b><u>Washington</u></b>	
	<b><u>Jackson</u></b>			
	<b><u>Lafayette</u></b>			
	<b><u>Lake</u></b>			
	<b><u>Madison</u></b>			
	<b><u>Marion</u></b>			
	<b><u>Okeechobee</u></b>			
	<b><u>Orange</u></b>			
	<b><u>Osceola</u></b>			
	<b><u>Polk</u></b>			
	<b><u>Putnam</u></b>			
	<b><u>Seminole</u></b>			
	<b><u>St. Johns</u></b>			
	<b><u>St. Lucie</u></b>			
	<b><u>Sumter</u></b>			
	<b><u>Suwannee</u></b>			
	<b><u>Union</u></b>			
	<b><u>Volusia</u></b>			



**Figure 2: Average Annual Rainfall Isopleth Map for Florida**

**Appendix N**  
**Mean Annual Runoff Coefficients (ROC Value) as a Function of DCIA Percentage and Non-DCIA Curve Number**

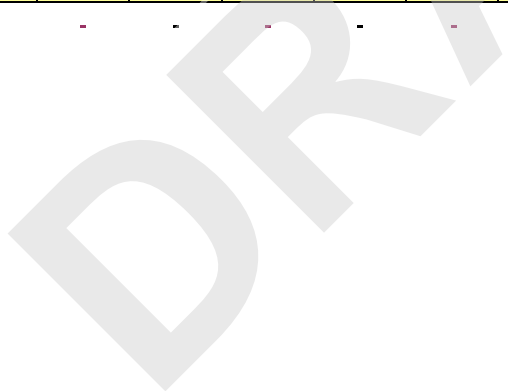
**ZONE 1**  
**Mean Annual Runoff Coefficients (ROC Value) as a Function**  
**of DCIA Percentage and Non-DCIA Curve Number**

NDCIA CN	Percent DCIA																				
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	0.006	0.048	0.090	0.132	0.175	0.217	0.259	0.301	0.343	0.386	0.428	0.470	0.512	0.554	0.596	0.639	0.681	0.723	0.765	0.807	0.849
35	0.009	0.051	0.093	0.135	0.177	0.219	0.261	0.303	0.345	0.387	0.429	0.471	0.513	0.555	0.597	0.639	0.681	0.723	0.765	0.807	0.849
40	0.014	0.056	0.098	0.139	0.181	0.223	0.265	0.307	0.348	0.390	0.432	0.474	0.515	0.557	0.599	0.641	0.682	0.724	0.766	0.808	0.849
45	0.020	0.062	0.103	0.145	0.186	0.228	0.269	0.311	0.352	0.394	0.435	0.476	0.518	0.559	0.601	0.642	0.684	0.725	0.767	0.808	0.849
50	0.029	0.070	0.111	0.152	0.193	0.234	0.275	0.316	0.357	0.398	0.439	0.480	0.521	0.562	0.603	0.644	0.685	0.726	0.767	0.808	0.849
55	0.039	0.079	0.120	0.161	0.201	0.242	0.282	0.323	0.363	0.404	0.444	0.485	0.525	0.566	0.606	0.647	0.687	0.728	0.768	0.809	0.849
60	0.052	0.092	0.132	0.172	0.212	0.252	0.291	0.331	0.371	0.411	0.451	0.491	0.531	0.570	0.610	0.650	0.690	0.730	0.770	0.810	0.849
65	0.069	0.108	0.147	0.186	0.225	0.264	0.303	0.342	0.381	0.420	0.459	0.498	0.537	0.576	0.615	0.654	0.693	0.732	0.771	0.810	0.849
70	0.092	0.130	0.167	0.205	0.243	0.281	0.319	0.357	0.395	0.433	0.471	0.508	0.546	0.584	0.622	0.660	0.698	0.736	0.774	0.812	0.849
75	0.121	0.158	0.194	0.230	0.267	0.303	0.340	0.376	0.412	0.449	0.485	0.522	0.558	0.595	0.631	0.667	0.704	0.740	0.777	0.813	0.849
80	0.162	0.196	0.230	0.265	0.299	0.334	0.368	0.402	0.437	0.471	0.506	0.540	0.574	0.609	0.643	0.678	0.712	0.746	0.781	0.815	0.849
85	0.220	0.252	0.283	0.315	0.346	0.378	0.409	0.441	0.472	0.503	0.535	0.566	0.598	0.629	0.661	0.692	0.724	0.755	0.787	0.818	0.849
90	0.312	0.339	0.366	0.393	0.419	0.446	0.473	0.500	0.527	0.554	0.581	0.608	0.634	0.661	0.688	0.715	0.742	0.769	0.796	0.823	0.849
95	0.478	0.496	0.515	0.533	0.552	0.571	0.589	0.608	0.626	0.645	0.664	0.682	0.701	0.719	0.738	0.757	0.775	0.794	0.812	0.831	0.849
98	0.656	0.666	0.676	0.685	0.695	0.705	0.714	0.724	0.734	0.743	0.753	0.763	0.772	0.782	0.792	0.801	0.811	0.821	0.830	0.840	0.849



**ZONE 2**  
**Mean Annual Runoff Coefficients (ROC Value) as a Function**  
**of DCIA Percentage and Non-DCIA Curve Number**

NDCIA CN	Percent DCIA																				
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	0.002	0.043	0.083	0.123	0.164	0.204	0.244	0.285	0.325	0.366	0.406	0.446	0.487	0.527	0.567	0.608	0.648	0.688	0.729	0.769	0.809
35	0.004	0.044	0.085	0.125	0.165	0.205	0.246	0.286	0.326	0.366	0.407	0.447	0.487	0.528	0.568	0.608	0.648	0.689	0.729	0.769	0.809
40	0.007	0.047	0.087	0.127	0.167	0.207	0.248	0.288	0.328	0.368	0.408	0.448	0.488	0.528	0.569	0.609	0.649	0.689	0.729	0.769	0.809
45	0.010	0.050	0.090	0.130	0.170	0.210	0.250	0.290	0.330	0.370	0.410	0.450	0.490	0.530	0.570	0.610	0.650	0.690	0.729	0.769	0.809
50	0.015	0.055	0.095	0.134	0.174	0.214	0.254	0.293	0.333	0.373	0.412	0.452	0.492	0.531	0.571	0.611	0.651	0.690	0.730	0.770	0.809
55	0.022	0.061	0.101	0.140	0.179	0.219	0.258	0.298	0.337	0.376	0.416	0.455	0.494	0.534	0.573	0.613	0.652	0.691	0.731	0.770	0.809
60	0.030	0.069	0.108	0.147	0.186	0.225	0.264	0.303	0.342	0.381	0.420	0.459	0.498	0.537	0.576	0.615	0.654	0.693	0.731	0.770	0.809
65	0.042	0.080	0.119	0.157	0.195	0.234	0.272	0.311	0.349	0.387	0.426	0.464	0.502	0.541	0.579	0.618	0.656	0.694	0.733	0.771	0.809
70	0.057	0.095	0.133	0.170	0.208	0.245	0.283	0.321	0.358	0.396	0.433	0.471	0.509	0.546	0.584	0.621	0.659	0.697	0.734	0.772	0.809
75	0.079	0.116	0.152	0.189	0.225	0.262	0.298	0.335	0.371	0.408	0.444	0.481	0.517	0.554	0.590	0.627	0.663	0.700	0.736	0.773	0.809
80	0.111	0.146	0.181	0.216	0.251	0.285	0.320	0.355	0.390	0.425	0.460	0.495	0.530	0.565	0.600	0.635	0.670	0.705	0.740	0.774	0.809
85	0.160	0.192	0.225	0.257	0.290	0.322	0.355	0.387	0.420	0.452	0.485	0.517	0.550	0.582	0.614	0.647	0.679	0.712	0.744	0.777	0.809
90	0.242	0.270	0.299	0.327	0.355	0.384	0.412	0.440	0.469	0.497	0.526	0.554	0.582	0.611	0.639	0.667	0.696	0.724	0.753	0.781	0.809
95	0.404	0.424	0.444	0.464	0.485	0.505	0.525	0.546	0.566	0.586	0.606	0.627	0.647	0.667	0.688	0.708	0.728	0.749	0.769	0.789	0.809
98	0.595	0.605	0.616	0.627	0.638	0.648	0.659	0.670	0.680	0.691	0.702	0.713	0.723	0.734	0.745	0.756	0.766	0.777	0.788	0.799	0.809





**ZONE 3**  
**Mean Annual Runoff Coefficients (ROC Value) as a Function**  
**of DCIA Percentage and Non-DCIA Curve Number**

NDCIA CN	Percent DCIA																				
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	0.008	0.047	0.087	0.126	0.165	0.205	0.244	0.283	0.323	0.362	0.401	0.441	0.480	0.519	0.559	0.598	0.637	0.677	0.716	0.756	0.795
35	0.012	0.051	0.090	0.129	0.168	0.207	0.247	0.286	0.325	0.364	0.403	0.442	0.482	0.521	0.560	0.599	0.638	0.677	0.717	0.756	0.795
40	0.016	0.055	0.094	0.133	0.172	0.211	0.250	0.289	0.328	0.367	0.406	0.445	0.483	0.522	0.561	0.600	0.639	0.678	0.717	0.756	0.795
45	0.022	0.061	0.099	0.138	0.177	0.215	0.254	0.292	0.331	0.370	0.408	0.447	0.486	0.524	0.563	0.602	0.640	0.679	0.718	0.756	0.795
50	0.029	0.067	0.105	0.144	0.182	0.220	0.259	0.297	0.335	0.374	0.412	0.450	0.488	0.527	0.565	0.603	0.642	0.680	0.718	0.757	0.795
55	0.037	0.075	0.113	0.151	0.189	0.227	0.265	0.302	0.340	0.378	0.416	0.454	0.492	0.530	0.568	0.605	0.643	0.681	0.719	0.757	0.795
60	0.048	0.085	0.123	0.160	0.197	0.235	0.272	0.309	0.347	0.384	0.421	0.459	0.496	0.533	0.571	0.608	0.645	0.683	0.720	0.758	0.795
65	0.061	0.098	0.134	0.171	0.208	0.244	0.281	0.318	0.355	0.391	0.428	0.465	0.501	0.538	0.575	0.611	0.648	0.685	0.721	0.758	0.795
70	0.078	0.114	0.149	0.185	0.221	0.257	0.293	0.329	0.365	0.400	0.436	0.472	0.508	0.544	0.580	0.616	0.651	0.687	0.723	0.759	0.795
75	0.100	0.135	0.170	0.204	0.239	0.274	0.308	0.343	0.378	0.413	0.447	0.482	0.517	0.552	0.586	0.621	0.656	0.691	0.725	0.760	0.795
80	0.131	0.164	0.197	0.231	0.264	0.297	0.330	0.363	0.397	0.430	0.463	0.496	0.529	0.562	0.596	0.629	0.662	0.695	0.728	0.762	0.795
85	0.177	0.208	0.239	0.269	0.300	0.331	0.362	0.393	0.424	0.455	0.486	0.517	0.548	0.579	0.609	0.640	0.671	0.702	0.733	0.764	0.795
90	0.252	0.279	0.306	0.333	0.360	0.388	0.415	0.442	0.469	0.496	0.523	0.550	0.578	0.605	0.632	0.659	0.686	0.713	0.741	0.768	0.795
95	0.399	0.419	0.439	0.458	0.478	0.498	0.518	0.538	0.557	0.577	0.597	0.617	0.637	0.656	0.676	0.696	0.716	0.735	0.755	0.775	0.795
98	0.578	0.589	0.600	0.611	0.622	0.633	0.643	0.654	0.665	0.676	0.687	0.697	0.708	0.719	0.730	0.741	0.752	0.762	0.773	0.784	0.795

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**ZONE 4**  
**Mean Annual Runoff Coefficients (ROC Value) as a Function**  
**of DCIA Percentage and Non-DCIA Curve Number**

NDCIA CN	Percent DCIA																				
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	0.004	0.045	0.086	0.127	0.168	0.209	0.250	0.291	0.332	0.373	0.414	0.455	0.496	0.536	0.577	0.618	0.659	0.700	0.741	0.782	0.823
35	0.007	0.048	0.089	0.129	0.170	0.211	0.252	0.293	0.333	0.374	0.415	0.456	0.497	0.537	0.578	0.619	0.660	0.701	0.741	0.782	0.823
40	0.011	0.051	0.092	0.133	0.173	0.214	0.254	0.295	0.336	0.376	0.417	0.458	0.498	0.539	0.579	0.620	0.661	0.701	0.742	0.782	0.823
45	0.016	0.056	0.096	0.137	0.177	0.217	0.258	0.298	0.339	0.379	0.419	0.460	0.500	0.540	0.581	0.621	0.662	0.702	0.742	0.783	0.823
50	0.022	0.062	0.102	0.142	0.182	0.222	0.262	0.302	0.342	0.382	0.423	0.463	0.503	0.543	0.583	0.623	0.663	0.703	0.743	0.783	0.823
55	0.030	0.070	0.109	0.149	0.189	0.228	0.268	0.308	0.347	0.387	0.427	0.466	0.506	0.546	0.585	0.625	0.664	0.704	0.744	0.783	0.823
60	0.040	0.080	0.119	0.158	0.197	0.236	0.275	0.314	0.353	0.393	0.432	0.471	0.510	0.549	0.588	0.627	0.667	0.706	0.745	0.784	0.823
65	0.054	0.092	0.131	0.169	0.208	0.246	0.285	0.323	0.362	0.400	0.438	0.477	0.515	0.554	0.592	0.631	0.669	0.708	0.746	0.785	0.823
70	0.071	0.109	0.147	0.184	0.222	0.259	0.297	0.335	0.372	0.410	0.447	0.485	0.522	0.560	0.598	0.635	0.673	0.710	0.748	0.785	0.823
75	0.096	0.132	0.168	0.205	0.241	0.277	0.314	0.350	0.387	0.423	0.459	0.496	0.532	0.568	0.605	0.641	0.678	0.714	0.750	0.787	0.823
80	0.130	0.165	0.199	0.234	0.268	0.303	0.338	0.372	0.407	0.442	0.476	0.511	0.546	0.580	0.615	0.650	0.684	0.719	0.754	0.788	0.823
85	0.182	0.214	0.246	0.278	0.310	0.342	0.374	0.406	0.438	0.470	0.502	0.534	0.566	0.599	0.631	0.663	0.695	0.727	0.759	0.791	0.823
90	0.266	0.294	0.322	0.350	0.378	0.406	0.433	0.461	0.489	0.517	0.545	0.573	0.600	0.628	0.656	0.684	0.712	0.740	0.767	0.795	0.823
95	0.429	0.449	0.469	0.488	0.508	0.528	0.547	0.567	0.587	0.606	0.626	0.646	0.665	0.685	0.705	0.725	0.744	0.764	0.784	0.803	0.823
98	0.616	0.626	0.636	0.647	0.657	0.667	0.678	0.688	0.699	0.709	0.719	0.730	0.740	0.750	0.761	0.771	0.782	0.792	0.802	0.813	0.823

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**ZONE 5**  
**Mean Annual Runoff Coefficients (ROC Value) as a Function**  
**of DCIA Percentage and Non-DCIA Curve Number**

NDCIA CN	Percent DCIA																				
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	0.008	0.048	0.088	0.128	0.168	0.208	0.248	0.288	0.328	0.368	0.408	0.448	0.488	0.528	0.568	0.608	0.648	0.688	0.728	0.768	0.808
35	0.012	0.052	0.092	0.132	0.171	0.211	0.251	0.291	0.331	0.370	0.410	0.450	0.490	0.529	0.569	0.609	0.649	0.689	0.728	0.768	0.808
40	0.018	0.057	0.097	0.136	0.176	0.215	0.255	0.294	0.334	0.373	0.413	0.452	0.492	0.531	0.571	0.611	0.650	0.690	0.729	0.769	0.808
45	0.025	0.064	0.103	0.142	0.182	0.221	0.260	0.299	0.338	0.377	0.417	0.456	0.495	0.534	0.573	0.612	0.651	0.691	0.730	0.769	0.808
50	0.034	0.072	0.111	0.150	0.189	0.227	0.266	0.305	0.343	0.382	0.421	0.460	0.498	0.537	0.576	0.614	0.653	0.692	0.731	0.769	0.808
55	0.044	0.082	0.121	0.159	0.197	0.235	0.273	0.312	0.350	0.388	0.426	0.464	0.502	0.541	0.579	0.617	0.655	0.693	0.732	0.770	0.808
60	0.057	0.095	0.132	0.170	0.207	0.245	0.282	0.320	0.357	0.395	0.433	0.470	0.508	0.545	0.583	0.620	0.658	0.695	0.733	0.770	0.808
65	0.073	0.110	0.147	0.183	0.220	0.257	0.294	0.330	0.367	0.404	0.441	0.477	0.514	0.551	0.588	0.624	0.661	0.698	0.735	0.771	0.808
70	0.093	0.129	0.165	0.201	0.236	0.272	0.308	0.344	0.379	0.415	0.451	0.486	0.522	0.558	0.594	0.629	0.665	0.701	0.737	0.772	0.808
75	0.120	0.155	0.189	0.223	0.258	0.292	0.327	0.361	0.395	0.430	0.464	0.498	0.533	0.567	0.602	0.636	0.670	0.705	0.739	0.774	0.808
80	0.157	0.189	0.222	0.254	0.287	0.319	0.352	0.385	0.417	0.450	0.482	0.515	0.547	0.580	0.613	0.645	0.678	0.710	0.743	0.775	0.808
85	0.209	0.239	0.269	0.299	0.329	0.359	0.389	0.419	0.449	0.479	0.509	0.538	0.568	0.598	0.628	0.658	0.688	0.718	0.748	0.778	0.808
90	0.292	0.318	0.343	0.369	0.395	0.421	0.447	0.472	0.498	0.524	0.550	0.576	0.602	0.627	0.653	0.679	0.705	0.731	0.756	0.782	0.808
95	0.445	0.464	0.482	0.500	0.518	0.536	0.554	0.572	0.590	0.609	0.627	0.645	0.663	0.681	0.699	0.717	0.736	0.754	0.772	0.790	0.808
98	0.614	0.624	0.633	0.643	0.653	0.662	0.672	0.682	0.692	0.701	0.711	0.721	0.730	0.740	0.750	0.760	0.769	0.779	0.789	0.798	0.808

## Appendix O

### Land Use Category Guide

A catchment is a land area from which runoff is created and at the point of discharge a BMP is possible. Land use categories are defined by all features of the catchment; thus, as an example, low intensity commercial areas include parking, building, and vegetated cover crop. A catchment can be further divided into a roof area catchment if there is a possibility of a BMP for the roof, as well as a parking/green space.

Table 1 General Land use descriptions

<u>GENERAL CATEGORY</u>	<u>DESCRIPTION</u>
<u>Low-Density Residential</u>	<u>Rural areas with lot sizes greater than 1 acre or less than one dwelling unit per acre; internal roadways associated with the homes are also included</u>
<u>Single-Family Residential</u>	<u>Typical detached home community with lot sizes generally less than 1 acre and dwelling densities greater than one dwelling unit per acre; duplexes constructed on one-third to one-half acre lots are also included in this category; internal roadways associated with the homes are also included</u>
<u>Multi-Family Residential</u>	<u>Residential land use consisting primarily of apartments, condominiums, and cluster-homes; internal roadways associated with the homes are also included</u>
<u>Low-Intensity Commercial</u>	<u>Areas which receive only a moderate amount of traffic volume where cars are parked during the day for extended periods of time; these areas include universities, schools, professional office sites, and small shopping centers; internal roadways associated with the development are also included</u>
<u>High-Intensity Commercial</u>	<u>Land use consisting of commercial areas with high levels of traffic volume and constant traffic moving in and out of the area; includes downtown areas, commercial sites, regional malls, and associated parking lots; internal roadways associated with the development are also included</u>
<u>Industrial</u>	<u>Land uses include manufacturing, shipping and transportation services, sewage treatment facilities, water supply plants, and solid waste disposal; internal roadways associated with the development are also included</u>
<u>Highway</u>	<u>Includes major road systems, such as interstate highways and major arteries and thoroughfares; roadway areas associated with residential, commercial, and industrial land use categories are already included in loading rates for these categories</u>
<u>General Natural</u>	<u>Includes open space, barren land, undeveloped land which may be occupied by native vegetation, rangeland, and power lines; this land does not include golf course areas which are heavily fertilized and managed; golf course areas have runoff characteristics most similar to single-family residential areas, but also may include some open space.</u>
<u>Agriculture</u>	<u>Includes cattle, grazing, row crops, citrus, and related activities</u>

Below is a summary of the FLUCCS code assignments to consolidated land use categories and EMCs. Not all FLUCCS Codes are listed here, and it is intended that this be only guidance for applicant. Site specific conditions must be used to specify the EMC, however, a land use category may differ from that listed in the table below based on the FLUCCS code due to cover, soil conditions, and topography.

**Table 2: FLUCCS code Land Use**

<u>FLUCCS CODE</u>	<u>LAND USE DESCRIPTION</u>	<u>GENERAL/ CONSOLIDATED LAND USE</u>	<u>EMC LAND USE I.D. NUMBER</u>
<u>1100</u>	<u>Residential, Low-Density-Less than two dwelling units/acre</u>	<u>Low-Density Residential</u>	<u>LOW DENSITY RES</u>
<u>1110</u>	<u>Fixed Single Family Units</u>	<u>Low-Density Residential</u>	<u>SINGLE FAMILY RES</u>
<u>1180</u>	<u>Residential, Rural &lt; or = 0.5 dwelling units/acre</u>	<u>Low-Density Residential</u>	<u>LOW DENSITY RES</u>
<u>1190</u>	<u>Low-Density Under Construction</u>	<u>Low-Density Residential</u>	<u>LOW DENSITY RES</u>
<u>1200</u>	<u>Residential, Medium-Density (Two-five dwelling units per acre)</u>	<u>Medium-Density Residential</u>	<u>SFR OR MFR DEPENDING ON UNITS</u>
<u>1210</u>	<u>Fixed Single Family Units</u>	<u>Medium-Density Residential</u>	<u>SINGLE FAMILY RES</u>
<u>1290</u>	<u>Medium-Density Under Construction</u>	<u>Medium-Density Residential</u>	<u>SFR OR MFR DEPENDING ON UNITS</u>
<u>1300</u>	<u>Residential, High-Density</u>	<u>High-Density Residential</u>	<u>MULTI FAMILY RES</u>
<u>1310</u>	<u>Fixed Single Family Units</u>	<u>High-Density Residential</u>	<u>SINGLE FAMILY RES</u>
<u>1320</u>	<u>Mobile Home Units</u>	<u>High-Density Residential</u>	<u>MULTI FAMILY RES</u>
<u>1330</u>	<u>Residential, High-Density; Multiple Dwelling Units, Low Rise &lt;Two stories or less&gt;</u>	<u>High-Density Residential</u>	<u>MULTI FAMILY RES</u>
<u>1340</u>	<u>Residential, High-Density; Multiple Dwelling Units, High Rise &lt;Three stories or more&gt;</u>	<u>High-Density Residential</u>	<u>MULTI FAMILY RES</u>
<u>1350</u>	<u>Residential, High-Density; Mixed Units &lt;Fixed and mobile Homes&gt;</u>	<u>High-Density Residential</u>	<u>MULTI FAMILY RES</u>
<u>1390</u>	<u>High-Density Under Construction</u>	<u>High-Density Residential</u>	<u>MULTI FAMILY RES</u>
<u>1400</u>	<u>Commercial and Services</u>	<u>Commercial</u>	<u>HIGH INTENSITY COMMERCIAL</u>
<u>1410</u>	<u>Retail Sales and Services</u>	<u>Commercial</u>	<u>HIGH INTENSITY COMMERCIAL</u>

<u>FLUCCS CODE</u>	<u>LAND USE DESCRIPTION</u>	<u>GENERAL/ CONSOLIDATED LAND USE</u>	<u>EMC LAND USE I.D. NUMBER</u>
<u>1420</u>	<u>Wholesale Sales and Services &lt;Excluding warehouses associated with industrial use&gt;</u>	<u>Commercial</u>	<u>LOW INTENSITY COMMERCIAL</u>
<u>1430</u>	<u>Professional Services</u>	<u>Commercial</u>	<u>LOW INTENSITY COMMERCIAL</u>
<u>1440</u>	<u>Cultural and Entertainment</u>	<u>Commercial</u>	<u>LOW INTENSITY COMMERCIAL</u>
<u>1450</u>	<u>Tourist Services</u>	<u>Commercial</u>	<u>HIGH INTENSITY COMMERCIAL</u>
<u>1460</u>	<u>Oil and Gas Storage(except industrial use or manufacturing)</u>	<u>Industrial</u>	<u>INDUSTRIAL</u>
<u>1470</u>	<u>Mixed Commercial and Services</u>	<u>Commercial</u>	<u>LOW INTENSITY COMMERCIAL</u>
<u>1480</u>	<u>Cemeteries</u>	<u>Recreational 1</u>	<u>AVERAGE OF SFR + UNDEVELOPED</u>
<u>1490</u>	<u>Commercial and Services Under Construction</u>	<u>Commercial</u>	<u>LOW INTENSITY COMMERCIAL</u>
<u>1500</u>	<u>Industrial Under Construction</u>	<u>Industrial</u>	<u>INDUSTRIAL</u>
<u>1510</u>	<u>Food Processing</u>	<u>Industrial</u>	<u>INDUSTRIAL</u>
<u>1520</u>	<u>Timber Processing</u>	<u>Industrial</u>	<u>INDUSTRIAL</u>
<u>1530</u>	<u>Mineral Processing</u>	<u>Industrial</u>	<u>INDUSTRIAL</u>
<u>1540</u>	<u>Oil and Gas Processing</u>	<u>Industrial</u>	<u>INDUSTRIAL</u>
<u>1550</u>	<u>Other Light Industrial</u>	<u>Industrial</u>	<u>INDUSTRIAL</u>
<u>1560</u>	<u>Other Heavy Industrial</u>	<u>Industrial</u>	<u>INDUSTRIAL</u>
<u>1561</u>	<u>Ship Building and Repair</u>	<u>Industrial</u>	<u>INDUSTRIAL</u>
<u>1562</u>	<u>Pre-stressed concrete plants</u>	<u>Industrial</u>	<u>INDUSTRIAL</u>
<u>1590</u>	<u>Industrial Under Construction</u>	<u>Industrial</u>	<u>INDUSTRIAL</u>
<u>1600</u>	<u>Extractive</u>	<u>Mining</u>	<u>MINING</u>
<u>1610</u>	<u>Strip Mines</u>	<u>Mining</u>	<u>MINING</u>
<u>1611</u>	<u>Clays</u>	<u>Mining</u>	<u>MINING</u>
<u>1620</u>	<u>Sand and Gravel Pits</u>	<u>Mining</u>	<u>MINING</u>
<u>1632</u>	<u>Limerock or dolomite quarries</u>	<u>Mining</u>	<u>MINING</u>
<u>1633</u>	<u>Phosphate quarries</u>	<u>Mining</u>	<u>MINING</u>

<u>FLUCCS CODE</u>	<u>LAND USE DESCRIPTION</u>	<u>GENERAL/ CONSOLIDATED LAND USE</u>	<u>EMC LAND USE I.D. NUMBER</u>
<u>1650</u>	<u>Reclaimed Land</u>	<u>Mining</u>	<u>MINING</u>
<u>1660</u>	<u>Holding Ponds</u>	<u>Mining</u>	<u>MINING</u>
<u>1700</u>	<u>Institutional (Educational, religious, health and military facilities)</u>	<u>Institutional</u>	<u>LOW INTENSITY COMMERCIAL</u>
<u>1710</u>	<u>Educational Facilities</u>	<u>Institutional</u>	<u>LOW INTENSITY COMMERCIAL</u>
<u>1720</u>	<u>Religious</u>	<u>Institutional</u>	<u>LOW INTENSITY COMMERCIAL</u>
<u>1730</u>	<u>Military</u>	<u>Institutional</u>	<u>LOW INTENSITY COMMERCIAL</u>
<u>1740</u>	<u>Medical and Health Care</u>	<u>Institutional</u>	<u>LOW INTENSITY COMMERCIAL</u>
<u>1750</u>	<u>Governmental</u>	<u>Institutional</u>	<u>LOW INTENSITY COMMERCIAL</u>
<u>1770</u>	<u>Other Institutional</u>	<u>Institutional</u>	<u>LOW INTENSITY COMMERCIAL</u>
<u>1780</u>	<u>Commercial Child Care</u>	<u>Institutional</u>	<u>LOW INTENSITY COMMERCIAL</u>
<u>1790</u>	<u>Institutional Under Construction</u>	<u>Institutional</u>	<u>LOW INTENSITY COMMERCIAL</u>
<u>1800</u>	<u>Recreational</u>	<u>Recreational 1</u>	<u>AVERAGE OF SFR + UNDEVELOPED</u>
<u>1810</u>	<u>Swimming Beach</u>	<u>Open</u>	<u>GENERAL NATURAL</u>
<u>1820</u>	<u>Golf Course</u>	<u>Recreational 1</u>	<u>AVERAGE OF SFR + UNDEVELOPED</u>
<u>1830</u>	<u>Race Tracks(horse, dog, car, motorcycle)</u>	<u>Recreational 2</u>	<u>AVERAGE OF MFR+UNDEVELOPPED</u>
<u>1840</u>	<u>Marinas and Fish Camps</u>	<u>Recreational 1</u>	<u>AVERAGE OF SFR + UNDEVELOPED</u>
<u>1850</u>	<u>Parks and Zoos</u>	<u>Recreational 2</u>	<u>AVERAGE OF MFR+UNDEVELOPPED</u>
<u>1860</u>	<u>Community Recreational Facilities</u>	<u>Recreational 2</u>	<u>AVERAGE OF MFR+UNDEVELOPPED</u>
<u>1870</u>	<u>Stadiums (not associated with high schools, colleges, or universities)</u>	<u>Recreational 2</u>	<u>AVERAGE OF MFR+UNDEVELOPPED</u>
<u>1890</u>	<u>Other Recreational(Riding stables, go-cart tracks, skeet ranges, etc.)</u>	<u>Recreational 2</u>	<u>AVERAGE OF MFR+UNDEVELOPPED</u>
<u>1900</u>	<u>Open Land</u>	<u>Open</u>	<u>GENERAL NATURAL</u>

<u>FLUCCS CODE</u>	<u>LAND USE DESCRIPTION</u>	<u>GENERAL/ CONSOLIDATED LAND USE</u>	<u>EMC LAND USE I.D. NUMBER</u>
<u>1920</u>	<u>Inactive Land with street patterns but without structures</u>	<u>Open</u>	<u>GENERAL NATURAL</u>
<u>2110</u>	<u>Improved Pasture</u>	<u>Pasture</u>	<u>PASTURE</u>
<u>2120</u>	<u>Unimproved Pastures</u>	<u>Pasture</u>	<u>PASTURE</u>
<u>2130</u>	<u>Woodland Pasture</u>	<u>Pasture</u>	<u>PASTURE</u>
<u>2140</u>	<u>Row Crops</u>	<u>Row Crops</u>	<u>ROW CROPS</u>
<u>2150</u>	<u>Field Crops</u>	<u>Row Crops</u>	<u>ROW CROPS</u>
<u>2160</u>	<u>Mixed Crops</u>	<u>Row Crops</u>	<u>ROW CROPS</u>
<u>2200</u>	<u>Tree Crops</u>	<u>Citrus</u>	<u>AG - CITRUS</u>
<u>2210</u>	<u>Citrus groves</u>	<u>Citrus</u>	<u>AG - CITRUS</u>
<u>2220</u>	<u>Fruit Orchards</u>	<u>Citrus</u>	<u>AG - CITRUS</u>
<u>2240</u>	<u>Abandoned tree crops</u>	<u>Ruderal</u>	<u>GENERAL NATURAL</u>
<u>2300</u>	<u>Feeding Operations</u>	<u>Agriculture</u>	<u>AG - GENERAL</u>
<u>2310</u>	<u>Cattle Feeding Operations</u>	<u>Agriculture</u>	<u>AG - GENERAL</u>
<u>2320</u>	<u>Poultry feeding operations</u>	<u>Agriculture</u>	<u>AG - GENERAL</u>
<u>2340</u>	<u>Other feeding operations</u>	<u>Agriculture</u>	<u>AG - GENERAL</u>
<u>2400</u>	<u>Nurseries and Vineyards</u>	<u>Agriculture</u>	<u>AG - GENERAL</u>
<u>2410</u>	<u>Tree nurseries</u>	<u>Agriculture</u>	<u>AG - GENERAL</u>
<u>2420</u>	<u>Sod farms</u>	<u>Agriculture</u>	<u>AG - GENERAL</u>
<u>2430</u>	<u>Ornamentals</u>	<u>Agriculture</u>	<u>AG - GENERAL</u>
<u>2431</u>	<u>Shade ferns</u>	<u>Agriculture</u>	<u>AG - GENERAL</u>
<u>2432</u>	<u>Hammock ferns</u>	<u>Agriculture</u>	<u>AG - GENERAL</u>
<u>2450</u>	<u>Floriculture</u>	<u>Agriculture</u>	<u>AG - GENERAL</u>
<u>2500</u>	<u>Specialty Farms</u>	<u>Agriculture</u>	<u>AG - GENERAL</u>
<u>2510</u>	<u>Horse Farms</u>	<u>Agriculture</u>	<u>AG - GENERAL</u>
<u>2520</u>	<u>Dairies</u>	<u>Agriculture</u>	<u>AG - GENERAL</u>
<u>2540</u>	<u>Aquaculture</u>	<u>Industrial</u>	<u>INDUSTRIAL</u>
<u>2590</u>	<u>Other Specialty Farms</u>	<u>Agriculture</u>	<u>AG - GENERAL</u>
<u>2600</u>	<u>Other Open Lands - Rural</u>	<u>Open</u>	<u>GENERAL NATURAL</u>
<u>2610</u>	<u>Fallow cropland</u>	<u>Open</u>	<u>GENERAL NATURAL</u>
<u>3100</u>	<u>Herbaceous Dry Prairie</u>	<u>Dry Prairie</u>	<u>GENERAL NATURAL</u>



<u>FLUCCS CODE</u>	<u>LAND USE DESCRIPTION</u>	<u>GENERAL/ CONSOLIDATED LAND USE</u>	<u>EMC LAND USE I.D. NUMBER</u>
<u>3200</u>	<u>Shrub and Brushland</u>	<u>Scrub</u>	<u>GENERAL NATURAL</u>
<u>3210</u>	<u>Palmetto Prairies</u>	<u>Dry Prairie</u>	<u>GENERAL NATURAL</u>
<u>3211</u>	<u>Palmetto-Oak Shrubland</u>	<u>Dry Prairie</u>	<u>GENERAL NATURAL</u>
<u>3212</u>	<u>Dry Prairie</u>	<u>Dry Prairie</u>	<u>GENERAL NATURAL</u>
<u>3220</u>	<u>Coastal Strand</u>	<u>Dry Prairie</u>	<u>GENERAL NATURAL</u>
<u>3300</u>	<u>Mixed Rangeland</u>	<u>Dry Prairie</u>	<u>GENERAL NATURAL</u>
<u>4110</u>	<u>Pine flatwoods</u>	<u>Wet Flatwoods</u>	<u>GENERAL NATURAL</u>
<u>4111</u>	<u>Mesic longleaf pine flatwoods</u>	<u>Upland Flatwoods</u>	<u>GENERAL NATURAL</u>
<u>4112</u>	<u>Scrubby Pine flatwoods</u>	<u>Upland Flatwoods</u>	<u>GENERAL NATURAL</u>
<u>4113</u>	<u>Hydric pine flatwoods</u>	<u>Wet Flatwoods</u>	<u>GENERAL NATURAL</u>
<u>4120</u>	<u>Longleaf pine - xeric oak</u>	<u>Upland Mixed</u>	<u>GENERAL NATURAL</u>
<u>4130</u>	<u>Sand pine</u>	<u>Scrub</u>	<u>GENERAL NATURAL</u>
<u>4140</u>	<u>Upland Mixed Forest</u>	<u>Upland Mixed</u>	<u>GENERAL NATURAL</u>
<u>4200</u>	<u>Upland Hardwood Forest</u>	<u>Upland Flatwoods</u>	<u>GENERAL NATURAL</u>
<u>4210</u>	<u>Xeric oak</u>	<u>Xeric Hammock</u>	<u>GENERAL NATURAL</u>
<u>4220</u>	<u>Brazilian Pepper</u>	<u>Ruderal</u>	<u>GENERAL NATURAL</u>
<u>4260</u>	<u>Tropical Hardwood Hammock</u>	<u>Wet Flatwoods</u>	<u>GENERAL NATURAL</u>
<u>4270</u>	<u>Maritime Hammock</u>	<u>Upland Mixed</u>	<u>GENERAL NATURAL</u>
<u>4271</u>	<u>Coastal Temperate Hammock</u>	<u>Upland Mixed</u>	<u>GENERAL NATURAL</u>
<u>4272</u>	<u>Prairie Hammock</u>	<u>Upland Mixed</u>	<u>GENERAL NATURAL</u>
<u>4275</u>	<u>Red Cedar- Cabbage Palm Hammock</u>	<u>Upland Mixed</u>	<u>GENERAL NATURAL</u>
<u>4280</u>	<u>Cabbage palm</u>	<u>Wet Flatwoods</u>	<u>GENERAL NATURAL</u>
<u>4300</u>	<u>Upland Hardwood Forests Continued</u>	<u>Upland Mixed</u>	<u>GENERAL NATURAL</u>
<u>4321</u>	<u>Xeric Oak Scrub</u>	<u>Xeric Hammock</u>	<u>GENERAL NATURAL</u>
<u>4322</u>	<u>Xeric Hammock</u>	<u>Xeric Hammock</u>	<u>GENERAL NATURAL</u>
<u>4340</u>	<u>Hardwood Conifer Mixed</u>	<u>Upland Flatwoods</u>	<u>GENERAL NATURAL</u>
<u>4370</u>	<u>Australian pine</u>	<u>Xeric Hammock</u>	<u>GENERAL NATURAL</u>
<u>4400</u>	<u>Tree Plantations</u>	<u>Upland Mixed</u>	<u>GENERAL NATURAL</u>
<u>4410</u>	<u>Coniferous pine</u>	<u>Xeric Hammock</u>	<u>GENERAL NATURAL</u>
<u>4430</u>	<u>Forest regeneration</u>	<u>Ruderal</u>	<u>GENERAL NATURAL</u>
<u>5474</u>	<u>Spoil islands/coastal islands</u>	<u>Upland Mixed</u>	<u>GENERAL NATURAL</u>

<u>FLUCCS CODE</u>	<u>LAND USE DESCRIPTION</u>	<u>GENERAL/ CONSOLIDATED LAND USE</u>	<u>EMC LAND USE I.D. NUMBER</u>
<u>6172</u>	<u>Mixed Shrubs</u>	<u>Wet Prairies</u>	<u>GENERAL NATURAL</u>
<u>6181</u>	<u>Cabbage palm hammock</u>	<u>Hydric Hammock</u>	<u>GENERAL NATURAL</u>
<u>6182</u>	<u>Cabbage palm savannah</u>	<u>Hydric Hammock</u>	<u>GENERAL NATURAL</u>
<u>6250</u>	<u>Hydric pine flatwoods</u>	<u>Mesic Flatwoods</u>	<u>GENERAL NATURAL</u>
<u>6430</u>	<u>Wet prairies</u>	<u>Wet Prairies</u>	<u>GENERAL NATURAL</u>
<u>7100</u>	<u>Beaches other than swimming beaches</u>	<u>Open</u>	<u>GENERAL NATURAL</u>
<u>7200</u>	<u>Sand other than beaches</u>	<u>Open</u>	<u>GENERAL NATURAL</u>
<u>7340</u>	<u>Exposed rocks</u>	<u>Open</u>	<u>GENERAL NATURAL</u>
<u>7400</u>	<u>Disturbed land</u>	<u>Open</u>	<u>GENERAL NATURAL</u>
<u>7410</u>	<u>Rural land in transition without positive indicators of intended activity</u>	<u>Open</u>	<u>GENERAL NATURAL</u>
<u>7430</u>	<u>Spoil areas</u>	<u>Open</u>	<u>GENERAL NATURAL</u>
<u>8100</u>	<u>Transportation</u>	<u>Transportation</u>	<u>HIGHWAY</u>
<u>8110</u>	<u>Airports</u>	<u>Institutional</u>	<u>LOW INTENSITY COMMERCIAL</u>
<u>8115</u>	<u>Grass Airports</u>	<u>Recreational 1</u>	<u>AVERAGE OF SFR + UNDEVELOPED</u>
<u>8120</u>	<u>Railroads</u>	<u>Open</u>	<u>GENERAL NATURAL</u>
<u>8130</u>	<u>Bus and truck terminals</u>	<u>Commercial</u>	<u>HIGH INTENSITY COMMERCIAL</u>
<u>8140</u>	<u>Roads and Highways</u>	<u>Transportation</u>	<u>HIGHWAY</u>
<u>8150</u>	<u>Port facilities</u>	<u>Commercial</u>	<u>HIGH INTENSITY COMMERCIAL</u>
<u>8160</u>	<u>Canals and Locks</u>	<u>Commercial</u>	<u>LOW INTENSITY COMMERCIAL</u>
<u>8180</u>	<u>Auto parking facilities - when not directly related to other land uses</u>	<u>Commercial</u>	<u>LOW INTENSITY COMMERCIAL</u>
<u>8191</u>	<u>Highways</u>	<u>Transportation</u>	<u>HIGHWAY</u>
<u>8200</u>	<u>Communications</u>	<u>Industrial</u>	<u>INDUSTRIAL</u>
<u>8220</u>	<u>Communication Facilities</u>	<u>Industrial</u>	<u>INDUSTRIAL</u>
<u>8300</u>	<u>Utilities</u>	<u>Industrial</u>	<u>INDUSTRIAL</u>
<u>8310</u>	<u>Electrical power facilities</u>	<u>Industrial</u>	<u>INDUSTRIAL</u>
<u>8320</u>	<u>Electrical power transmission lines</u>	<u>Open</u>	<u>GENERAL NATURAL</u>
<u>8330</u>	<u>Water supply plants</u>	<u>Industrial</u>	<u>INDUSTRIAL</u>
<u>8340</u>	<u>Sewage Treatment</u>	<u>Industrial</u>	<u>INDUSTRIAL</u>

<u>FLUCCS CODE</u>	<u>LAND USE DESCRIPTION</u>	<u>GENERAL/ CONSOLIDATED LAND USE</u>	<u>EMC LAND USE I.D. NUMBER</u>
<u>8350</u>	<u>Solid waste disposal</u>	<u>Industrial</u>	<u>INDUSTRIAL</u>
<u>8360</u>	<u>Other treatment ponds</u>	<u>Industrial</u>	<u>INDUSTRIAL</u>
<u>8390</u>	<u>Utilities under construction</u>	<u>Industrial</u>	<u>INDUSTRIAL</u>
<u>9999</u>	<u>(blank)</u>	<u>Open</u>	<u>GENERAL NATURAL</u>

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Appendix P

Traditional BMP Treatment Efficiencies

Directions for use

This listing of BMPs defines the treatment efficiencies for total phosphorous (TP) and total nitrogen (TN) for traditional BMPs. Applicants will determine the predicted pollutant loading from their post development site the treatment efficiency required as described in applicant’s Handbook Volume I. Treatment efficiencies for traditional BMPs alone are listed in the table. Some BMPs do not have a static efficiency and the applicant will have to refer to the formulas or tables provided to calculate the BMP’s efficiency. Applicants will design their system so that their BMP’s Efficiency, either by itself or in series with others, matches the required efficiency set forth in AH Vol I. BMPs designed in series will have their treatment efficiencies calculated by the formula listed in the BMP Treatment Train section.

All BMPs are required to meet all the design requirements outlined in the applicable Applicant’s Handbook Volume II.

Table of BMP Efficiencies

<u>BMP type</u>	<u>Standard BMPs</u>	<u>TP Reduction</u>	<u>TN Reduction</u>	<u>Data Source</u>
<u>Retention</u>	<u>Retention Pond and Retention Systems</u>	<u>Based on percent reduction using project’s percent directly connected impervious area (DCIA), non-DCIA curve number (CN), and rainfall zone</u>	<u>Based on percent reduction using project’s percent directly connected impervious area (DCIA), non-DCIA curve number (CN), and rainfall zone</u>	<u>Evaluation of current stormwater design criteria within the state of Florida, Harper and Baker 2007</u>
<u>Detention</u>	<u>Wet detention ponds</u>	<u>Formula shown in Figure for Removal Efficiency of Total Phosphorus</u>	<u>Formula shown in Figure Removal Efficiency of Total Nitrogen</u>	<u>Evaluation of current stormwater design criteria within the state of Florida, Harper and Baker 2007</u>
	<u>Detention with Filtration</u>	<u>Use appropriate detention calculation and include media % removal as a treatment train</u>	<u>Use appropriate detention calculation and include media % removal as a treatment train</u>	<u>March 2010 draft DEP and WMDs ERP Stormwater Quality Applicant’s Handbook</u>
<u>Baffle Boxes</u>	<u>Baffle boxes (gravity-based separators)—First generation</u>	<u>2.30%</u>	<u>0.50%</u>	<u>Final report, Contract S0236, Effectiveness of baffle boxes plus media filter, by GPI</u>

<u>BMP type</u>	<u>Standard BMPs</u>	<u>TP Reduction</u>	<u>TN Reduction</u>	<u>Data Source</u>
	<u>Baffle boxes (gravity-based separators)— Second generation</u>	<u>15.50%</u>	<u>19.05%</u>	<u>Southeast 2010; Demonstration bio media for ultra-urban stormwater treatment, by University of Central Florida (UCF) for Florida Department of Transportation (FDOT); and Final report, Contract S0497, Baffle box with media filtration installation and effectiveness evaluation by City of Casselberry.</u>
	<u>Baffle boxes (gravity-based separators)— Second generation plus media filter</u>	<u>Media Mix Efficiency</u>	<u>Media Mix Efficiency</u>	
<u>Hydrodynamic Separators</u>	<u>Hydrodynamic separators (including vortex and continuous deflector separators [CDS] units)</u>	<u>10%</u>	<u>N/A</u>	<u>Final Report, Contract S0095, Sanford Stormceptor Project, 2008; Final Report, Contract WM793, Broadway Outfall Project, 2006</u>
<u>Material Collection</u>	<u>Street sweeping (materials collected from roadway and gutter sweeping) Do not include baffle box material collected</u> <u>Catch basin inserts/inlet filter cleanout (drainage features and units with no specific water quality treatment mechanism), including the following:</u> <u>• Curb inlets. • Area catch basins. • Pavement catch basins. • Projects serving drainage and conveyance functions.</u>	<u>Determine annual average dry weight/volume of material collected over a period of 3 years (or representative period of current effort) and enter values into the Florida Stormwater Association (FSA) University of Florida (UF) Municipal Separate Storm Sewer (MS4) BMP Toolkit (<a href="#">FINAL MS4 Load Reduction Tool 2019 or newer version</a>) for estimated TP reduction</u>	<u>Determine annual average dry weight/volume of material collected over a period of 3 years (or representative period of current effort) and enter values into the Florida Stormwater Association (FSA) University of Florida (UF) Municipal Separate Storm Sewer (MS4) BMP Toolkit (<a href="#">FINAL MS4 Load Reduction Tool 2019 or newer version</a>) for estimated TN reduction</u>	<u>2019 Final Report (or newer version), FSA UF MS4 BMP Project</u>

<u>BMP type</u>	<u>Standard BMPs</u>	<u>TP Reduction</u>	<u>TN Reduction</u>	<u>Data Source</u>
<a href="#">Green Stormwater Infrastructure Efforts</a>	<u>Green Roofs, Rain gardens, Swales with blocks, Bioswales, Tree boxes, Tree wells, Vegetated Natural Buffers, Vegetated filter strip, Pervious Pavement Systems</u>	<u>Use appropriate retention or detention calculation for volume captured then add an additional removal based on plant, soil and media selections in a treatment train configuration.</u>	<u>Use appropriate retention or detention calculation for volume captured then add an additional removal based on plant, soil and media selections in a treatment train configuration.</u>	<u>Evaluation of current stormwater design criteria within the state of Florida, Harper and Baker 2007</u>
<u>Other</u>	<u>Stormwater alum injection systems</u>	<u>based on dosage determined in jar testing</u>	<u>based on dosage determined in jar testing</u>	<u>Harper, H., and J. Herr 1998 study for DEP – Alum treatment of stormwater: The first ten years</u>
	<u>Floating islands/managed aquatic plant systems (MAPS)</u>	<u>10 %- 20% removal with 5 % pond coverage based on harvesting at least every 12 months.</u>	<u>10 %-20% removal with 5 % pond coverage based on harvesting at least every 12 months.</u>	<u>UCF studies</u>
	<u>Stormwater harvesting</u>	<u>Use appropriate detention calculation and add % removal of harvested volume as a treatment train</u>	<u>Use appropriate detention calculation and add % removal of harvested volume as a treatment train</u>	<u>Evaluation of current stormwater design criteria within the state of Florida, Harper and Baker 2007</u>

### Treatment Train

BMPs can be implemented in combination or in conjunction with one another in a series called a "BMP Treatment Train". If used, BMP efficiencies must account for the reduced loading transferred to subsequent downstream treatment devices. As stormwater pollutant concentrations are reduced in each BMP in the treatment train, the ability of a BMP treatment train to further reduce stormwater pollutant concentrations and loads is diminished. This is shown in Equation 9-5. This assumes each BMP acts independently of upstream BMPs and that upstream BMPs do not impact performance of downstream BMPs. If the BMP acts in combination with the upstream BMP the designer will take into consideration the use of another methodology to determine the resultant efficiency of the BMP Treatment Train.

Equation 9-5: Overall Treatment Train Efficiency for systems in series

$$\begin{aligned} \text{Overall Treatment Train Efficiency} &= \text{Eff1} + [(1 - \text{Eff1}) \times \text{Eff2}] \\ &+ [(1 - (\text{Eff1} + \text{Eff2})) \times \text{Eff3}] \end{aligned}$$

$$\text{Overall Treatment Train Efficiency} = \text{Eff1} + 1 - \text{Eff1} \times \text{Eff2} + [(1 - (\text{Eff1} + \text{Eff2})) \times \text{Eff3}]$$

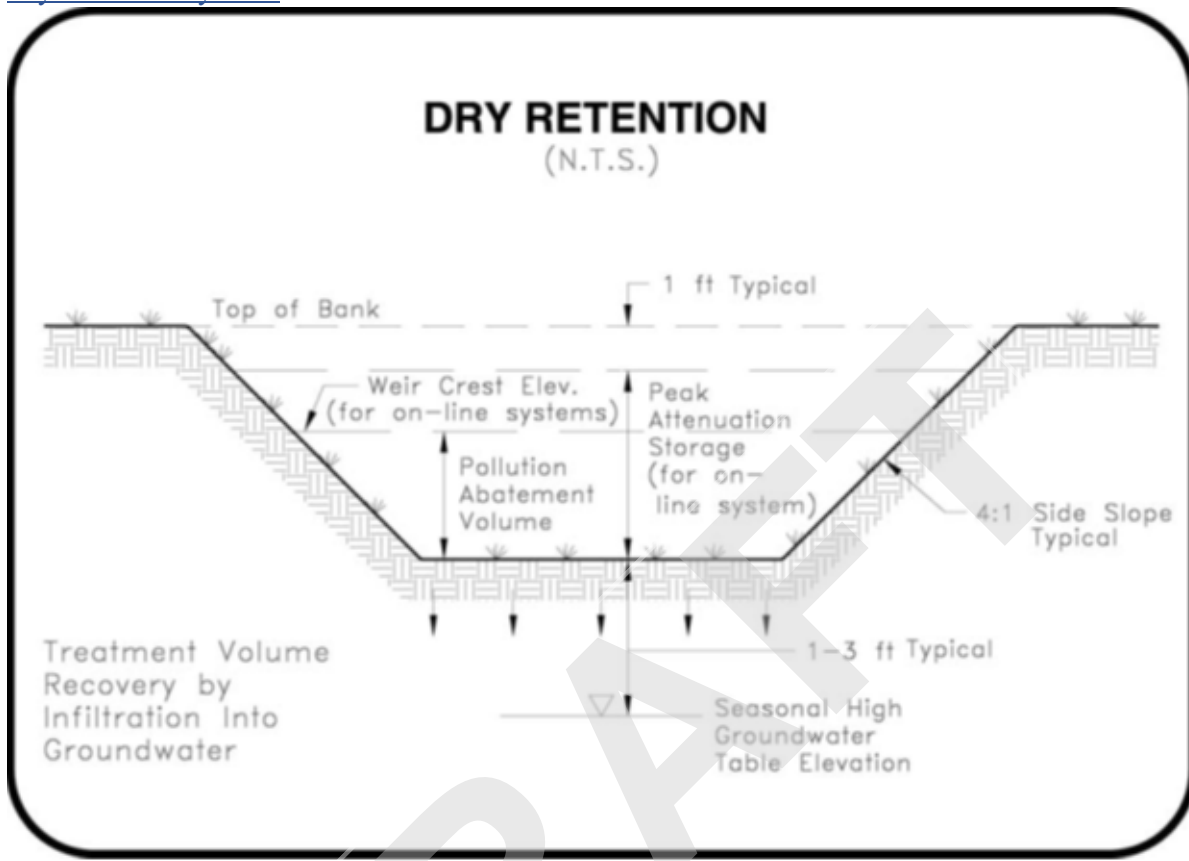
Eff1 = efficiency of initial treatment system

Eff2 = efficiency of second treatment system

Eff3 = efficiency of third treatment system

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## Dry Retention Systems



The average annual effectiveness is calculated using an event maximum runoff volume that can be captured in the retention system. This maximum volume is expressed as inches over the catchment area and is called the design volume. It is adjusted for the Curve Number (CN) applied to the non-directly connected impervious area (NDCIA) and the directly connected impervious area (DCIA).

Recovery of the required treatment volume must be achieved within 72 hours or less, equivalent to the volume recovery period utilized for generation of the performance efficiency summarized in the tables. Ability of the pond to achieve this recovery rate must be certified by a registered geotechnical engineer. All side slopes and bottom areas of the pond must be seeded or sodded with water-tolerant grass species grown on sandy soils. If sod is used as the vegetative cover on the bottom of the pond, changes in permeability of the basin resulting from the sod must be included in evaluation of the recovery period for the pond. Inlets and outlets must be located as far apart as possible to prevent short-circuiting. Oil and grease skimmers must be provided at all outfall structures. Other requirements related to side slopes, fencing, maintenance berms, and access will adhere to applicable local agency criteria.

There are 80 tables reflecting design retention depths for five rainfall regions. Each region has a table for 17 different design retention depths. For DCIA and CN other than increments of 5, linear interpolation between the values is performed.



### Mean Annual Mass Removal Efficiencies for 0.25-inches of Retention for Zone 1

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	86.2	81.3	73.3	65.5	58.7	53.0	48.3	44.2	40.8	37.9	35.3	33.1	31.1	29.4	27.8	26.4	25.1	24.0	22.9	21.9
35	81.6	78.7	71.7	64.5	58.0	52.5	47.9	44.0	40.6	37.7	35.2	33.0	31.0	29.3	27.8	26.4	25.1	23.9	22.9	21.9
40	76.4	75.5	69.6	63.1	57.1	51.9	47.4	43.6	40.3	37.5	35.0	32.9	30.9	29.2	27.7	26.3	25.1	23.9	22.9	21.9
45	70.7	71.7	67.2	61.4	55.9	51.0	46.8	43.1	40.0	37.2	34.8	32.7	30.8	29.1	27.6	26.3	25.0	23.9	22.9	21.9
50	64.7	67.5	64.2	59.4	54.5	50.0	46.0	42.6	39.5	36.9	34.6	32.5	30.7	29.0	27.5	26.2	25.0	23.9	22.9	21.9
55	58.6	62.8	60.9	57.0	52.7	48.7	45.1	41.8	39.0	36.5	34.2	32.3	30.5	28.9	27.4	26.1	24.9	23.9	22.9	21.9
60	52.8	57.8	57.1	54.2	50.7	47.1	43.9	40.9	38.3	35.9	33.8	31.9	30.2	28.7	27.3	26.0	24.9	23.8	22.8	21.9
65	47.3	52.6	53.0	51.1	48.3	45.3	42.5	39.8	37.4	35.3	33.3	31.5	29.9	28.4	27.1	25.9	24.8	23.8	22.8	21.9
70	42.2	47.3	48.6	47.6	45.6	43.2	40.8	38.5	36.4	34.4	32.6	31.0	29.5	28.1	26.9	25.7	24.7	23.7	22.8	21.9
75	37.8	42.2	43.9	43.7	42.4	40.7	38.8	36.9	35.1	33.4	31.8	30.4	29.0	27.8	26.6	25.5	24.5	23.6	22.7	21.9
80	34.0	37.5	39.1	39.4	38.8	37.7	36.4	34.9	33.5	32.1	30.8	29.5	28.3	27.2	26.2	25.2	24.3	23.5	22.7	21.9
85	30.8	33.1	34.3	34.8	34.7	34.2	33.4	32.5	31.4	30.4	29.4	28.4	27.4	26.5	25.7	24.8	24.1	23.3	22.6	21.9
90	27.9	29.2	29.9	30.3	30.3	30.2	29.8	29.3	28.8	28.2	27.5	26.8	26.2	25.5	24.9	24.2	23.6	23.0	22.5	21.9
95	25.3	25.6	25.8	25.9	26.0	25.9	25.8	25.6	25.4	25.2	24.9	24.6	24.3	24.0	23.6	23.3	23.0	22.6	22.3	21.9
98	23.8	23.8	23.8	23.7	23.7	23.6	23.5	23.4	23.3	23.2	23.1	23.0	22.9	22.8	22.6	22.5	22.4	22.2	22.1	21.9

### Mean Annual Mass Removal Efficiencies for 0.50-inches of Retention for Zone 1

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	91.8	91.5	88.3	84.0	79.5	75.0	70.7	66.6	62.9	59.6	56.5	53.6	51.1	48.7	46.6	44.6	42.8	41.1	39.6	38.1
35	88.2	89.1	86.6	82.8	78.6	74.3	70.1	66.2	62.6	59.3	56.3	53.5	51.0	48.7	46.5	44.6	42.8	41.1	39.6	38.1
40	84.0	86.3	84.4	81.2	77.4	73.4	69.4	65.7	62.2	59.0	56.0	53.3	50.8	48.5	46.4	44.5	42.7	41.1	39.6	38.1
45	79.6	82.9	81.9	79.3	75.9	72.2	68.5	65.0	61.7	58.6	55.7	53.0	50.6	48.4	46.3	44.4	42.7	41.0	39.5	38.1
50	74.8	79.1	79.0	77.0	74.1	70.8	67.4	64.1	61.0	58.0	55.3	52.7	50.4	48.2	46.2	44.3	42.6	41.0	39.5	38.1
55	70.1	74.9	75.6	74.2	71.9	69.1	66.1	63.0	60.1	57.3	54.7	52.3	50.0	47.9	46.0	44.2	42.5	40.9	39.5	38.1
60	65.5	70.4	71.7	71.1	69.4	67.0	64.4	61.7	59.1	56.5	54.1	51.8	49.6	47.6	45.8	44.0	42.4	40.9	39.5	38.1
65	61.0	65.8	67.5	67.6	66.4	64.7	62.5	60.2	57.8	55.5	53.3	51.1	49.1	47.2	45.5	43.8	42.3	40.8	39.4	38.1
70	56.7	61.1	63.1	63.6	63.1	61.9	60.2	58.3	56.3	54.3	52.3	50.3	48.5	46.8	45.1	43.5	42.1	40.7	39.4	38.1
75	52.7	56.6	58.6	59.3	59.3	58.6	57.5	56.0	54.4	52.7	51.0	49.3	47.7	46.1	44.6	43.2	41.8	40.5	39.3	38.1
80	49.1	52.2	54.1	55.0	55.2	54.9	54.2	53.2	52.1	50.8	49.4	48.0	46.6	45.3	44.0	42.7	41.5	40.3	39.2	38.1
85	46.1	48.3	49.7	50.5	50.8	50.8	50.5	49.9	49.2	48.3	47.3	46.3	45.2	44.2	43.1	42.1	41.0	40.0	39.1	38.1
90	43.5	44.8	45.6	46.1	46.4	46.5	46.4	46.1	45.7	45.2	44.6	44.0	43.3	42.6	41.9	41.1	40.4	39.6	38.9	38.1
95	41.1	41.5	41.8	41.9	42.0	42.1	42.0	41.9	41.8	41.6	41.3	41.1	40.8	40.4	40.1	39.7	39.3	38.9	38.5	38.1
98	39.8	39.8	39.8	39.8	39.8	39.7	39.7	39.6	39.5	39.4	39.3	39.2	39.1	39.0	38.9	38.7	38.6	38.4	38.3	38.1

**Mean Annual Mass Removal Efficiencies for 0.75-inches of Retention for Zone 1**

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	94.0	94.9	93.4	91.0	88.1	85.0	81.8	78.7	75.5	72.6	69.7	67.0	64.5	62.1	59.8	57.7	55.7	53.8	52.1	50.5
35	91.2	93.0	91.9	89.8	87.2	84.2	81.2	78.2	75.2	72.3	69.5	66.8	64.3	62.0	59.7	57.6	55.7	53.8	52.1	50.5
40	88.1	90.5	90.1	88.3	86.0	83.3	80.5	77.6	74.7	71.9	69.2	66.6	64.1	61.8	59.6	57.6	55.6	53.8	52.1	50.5
45	84.5	87.7	87.9	86.5	84.5	82.1	79.5	76.8	74.0	71.4	68.8	66.3	63.9	61.6	59.5	57.5	55.5	53.7	52.0	50.5
50	80.8	84.6	85.2	84.4	82.8	80.7	78.3	75.8	73.3	70.7	68.3	65.9	63.6	61.4	59.3	57.3	55.5	53.7	52.0	50.5
55	77.1	81.1	82.2	81.9	80.7	79.0	76.9	74.6	72.3	70.0	67.6	65.4	63.2	61.1	59.1	57.2	55.3	53.6	52.0	50.5
60	73.2	77.5	79.0	79.1	78.3	76.9	75.2	73.2	71.1	69.0	66.9	64.7	62.7	60.7	58.8	56.9	55.2	53.5	51.9	50.5
65	69.6	73.8	75.4	75.8	75.5	74.5	73.2	71.5	69.7	67.8	65.9	63.9	62.0	60.2	58.4	56.7	55.0	53.4	51.9	50.5
70	66.1	69.9	71.7	72.3	72.3	71.7	70.8	69.5	68.0	66.4	64.7	63.0	61.3	59.6	57.9	56.3	54.8	53.3	51.8	50.5
75	62.7	66.0	67.8	68.6	68.8	68.5	67.9	67.1	65.9	64.7	63.3	61.8	60.3	58.8	57.3	55.9	54.5	53.1	51.7	50.5
80	59.6	62.2	63.8	64.7	65.1	65.1	64.8	64.2	63.4	62.5	61.4	60.3	59.1	57.8	56.6	55.3	54.0	52.8	51.6	50.5
85	56.8	58.7	60.0	60.8	61.2	61.4	61.3	61.0	60.5	59.9	59.1	58.3	57.4	56.5	55.5	54.5	53.5	52.5	51.4	50.5
90	54.5	55.6	56.4	57.0	57.3	57.5	57.5	57.4	57.2	56.8	56.4	55.9	55.4	54.7	54.1	53.4	52.7	51.9	51.2	50.5
95	52.5	52.9	53.2	53.3	53.5	53.6	53.6	53.6	53.5	53.4	53.2	53.0	52.8	52.5	52.2	51.9	51.6	51.2	50.8	50.5
98	51.7	51.7	51.7	51.7	51.7	51.7	51.7	51.6	51.6	51.5	51.4	51.3	51.3	51.2	51.1	51.0	50.8	50.7	50.6	50.5

**Mean Annual Mass Removal Efficiencies for 1.00-inches of Retention for Zone 1**

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	95.3	96.5	95.9	94.4	92.5	90.3	87.9	85.5	83.1	80.6	78.2	75.8	73.6	71.4	69.2	67.2	65.3	63.4	61.6	60.0
35	93.1	94.9	94.6	93.3	91.6	89.5	87.3	85.0	82.7	80.3	77.9	75.6	73.4	71.2	69.1	67.1	65.2	63.4	61.6	60.0
40	90.7	93.0	93.0	92.0	90.5	88.6	86.6	84.4	82.1	79.9	77.6	75.4	73.2	71.1	69.0	67.0	65.2	63.3	61.6	60.0
45	88.0	90.7	91.0	90.5	89.2	87.5	85.6	83.6	81.5	79.3	77.2	75.0	72.9	70.9	68.8	66.9	65.1	63.3	61.6	60.0
50	85.0	88.0	88.8	88.6	87.6	86.2	84.5	82.7	80.7	78.7	76.6	74.6	72.6	70.6	68.6	66.8	65.0	63.2	61.6	60.0
55	81.8	85.3	86.4	86.3	85.7	84.6	83.2	81.5	79.8	77.9	75.9	74.0	72.1	70.2	68.4	66.6	64.8	63.1	61.5	60.0
60	78.7	82.3	83.6	83.9	83.5	82.7	81.5	80.1	78.6	76.9	75.1	73.4	71.6	69.8	68.0	66.3	64.7	63.0	61.5	60.0
65	75.6	79.1	80.6	81.2	81.0	80.5	79.6	78.5	77.2	75.7	74.1	72.5	70.9	69.3	67.6	66.0	64.4	62.9	61.4	60.0
70	72.7	75.9	77.5	78.2	78.3	78.0	77.4	76.5	75.5	74.2	72.9	71.5	70.1	68.6	67.1	65.6	64.2	62.7	61.3	60.0
75	69.9	72.7	74.2	75.0	75.3	75.2	74.8	74.2	73.4	72.5	71.4	70.3	69.1	67.8	66.5	65.1	63.8	62.5	61.2	60.0
80	67.2	69.5	70.8	71.7	72.1	72.1	72.0	71.6	71.1	70.4	69.6	68.7	67.8	66.7	65.6	64.5	63.4	62.2	61.1	60.0
85	64.8	66.5	67.6	68.3	68.7	68.9	68.9	68.7	68.4	68.0	67.5	66.8	66.1	65.4	64.5	63.7	62.8	61.8	60.9	60.0
90	62.7	63.7	64.4	65.0	65.3	65.5	65.6	65.6	65.5	65.2	65.0	64.6	64.2	63.7	63.1	62.6	61.9	61.3	60.6	60.0
95	61.1	61.5	61.8	62.0	62.1	62.2	62.3	62.3	62.3	62.2	62.1	62.0	61.8	61.6	61.4	61.2	60.9	60.6	60.3	60.0
98	60.7	60.7	60.7	60.8	60.8	60.8	60.8	60.8	60.7	60.7	60.7	60.6	60.6	60.5	60.4	60.3	60.3	60.2	60.1	60.0

### Mean Annual Mass Removal Efficiencies for 1.25-inches of Retention for Zone 1

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	96.1	97.3	97.2	96.3	94.9	93.4	91.6	89.7	87.8	85.8	83.8	81.8	79.9	77.9	76.0	74.2	72.4	70.6	68.9	67.3
35	94.5	96.1	96.2	95.4	94.1	92.7	91.0	89.2	87.4	85.5	83.5	81.6	79.7	77.8	75.9	74.1	72.3	70.6	68.9	67.3
40	92.5	94.5	94.8	94.2	93.2	91.9	90.3	88.6	86.9	85.0	83.2	81.3	79.5	77.6	75.8	74.0	72.3	70.6	68.9	67.3
45	90.4	92.7	93.2	92.8	92.0	90.9	89.4	87.9	86.3	84.5	82.8	81.0	79.2	77.4	75.6	73.9	72.2	70.5	68.9	67.3
50	88.0	90.6	91.3	91.2	90.6	89.7	88.4	87.0	85.5	83.9	82.2	80.5	78.8	77.1	75.4	73.7	72.1	70.4	68.9	67.3
55	85.4	88.2	89.2	89.3	88.9	88.2	87.2	86.0	84.6	83.1	81.6	80.0	78.4	76.7	75.1	73.5	71.9	70.3	68.8	67.3
60	82.7	85.7	86.9	87.2	87.0	86.5	85.7	84.7	83.5	82.2	80.8	79.3	77.8	76.3	74.8	73.2	71.7	70.2	68.8	67.3
65	80.1	83.1	84.4	84.9	84.9	84.5	83.9	83.1	82.1	81.0	79.8	78.5	77.1	75.7	74.3	72.9	71.5	70.1	68.7	67.3
70	77.6	80.3	81.7	82.4	82.5	82.4	81.9	81.3	80.6	79.7	78.6	77.5	76.3	75.1	73.8	72.5	71.2	69.9	68.6	67.3
75	75.2	77.6	79.0	79.7	80.0	79.9	79.7	79.3	78.7	78.0	77.2	76.3	75.3	74.2	73.1	72.0	70.9	69.7	68.5	67.3
80	73.0	74.9	76.1	76.8	77.2	77.3	77.3	77.0	76.6	76.1	75.5	74.8	74.0	73.2	72.3	71.4	70.4	69.4	68.4	67.3
85	70.9	72.3	73.3	73.9	74.3	74.5	74.6	74.5	74.3	73.9	73.5	73.1	72.5	71.9	71.2	70.5	69.8	69.0	68.2	67.3
90	69.2	70.0	70.6	71.1	71.4	71.6	71.7	71.7	71.7	71.5	71.3	71.1	70.7	70.4	70.0	69.5	69.0	68.5	67.9	67.3
95	67.8	68.1	68.4	68.6	68.7	68.9	68.9	69.0	69.0	69.0	68.9	68.9	68.7	68.6	68.5	68.3	68.1	67.8	67.6	67.3
98	67.7	67.7	67.7	67.8	67.8	67.8	67.8	67.8	67.8	67.8	67.8	67.8	67.7	67.7	67.6	67.6	67.5	67.5	67.4	67.3

### Mean Annual Mass Removal Efficiencies for 1.50-inches of Retention for Zone 1

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	96.8	97.8	98.0	97.5	96.5	95.3	94.0	92.5	90.9	89.3	87.7	86.0	84.3	82.7	81.0	79.3	77.7	76.1	74.6	73.1
35	95.5	96.9	97.1	96.7	95.8	94.7	93.5	92.1	90.6	89.0	87.4	85.8	84.1	82.5	80.9	79.3	77.7	76.1	74.6	73.1
40	93.9	95.6	96.0	95.7	95.0	94.0	92.8	91.5	90.1	88.6	87.1	85.5	83.9	82.3	80.7	79.2	77.6	76.1	74.6	73.1
45	92.1	94.2	94.7	94.5	93.9	93.1	92.0	90.8	89.5	88.1	86.6	85.1	83.6	82.1	80.6	79.0	77.5	76.0	74.5	73.1
50	90.3	92.5	93.1	93.1	92.7	92.0	91.1	90.0	88.8	87.5	86.1	84.7	83.3	81.8	80.3	78.9	77.4	75.9	74.5	73.1
55	88.2	90.5	91.3	91.4	91.2	90.7	89.9	89.0	87.9	86.8	85.5	84.2	82.8	81.5	80.1	78.6	77.2	75.8	74.4	73.1
60	85.9	88.3	89.3	89.6	89.6	89.2	88.6	87.8	86.9	85.9	84.7	83.5	82.3	81.0	79.7	78.4	77.0	75.7	74.4	73.1
65	83.5	86.0	87.2	87.7	87.7	87.5	87.0	86.4	85.7	84.8	83.8	82.8	81.7	80.5	79.3	78.1	76.8	75.6	74.3	73.1
70	81.4	83.7	85.0	85.5	85.7	85.6	85.3	84.8	84.2	83.5	82.7	81.8	80.9	79.9	78.8	77.7	76.5	75.4	74.2	73.1
75	79.4	81.4	82.5	83.2	83.5	83.5	83.3	83.0	82.6	82.1	81.4	80.7	79.9	79.1	78.1	77.2	76.2	75.2	74.1	73.1
80	77.4	79.1	80.1	80.8	81.1	81.2	81.2	81.0	80.8	80.4	79.9	79.4	78.8	78.1	77.3	76.5	75.7	74.9	74.0	73.1
85	75.7	76.9	77.7	78.3	78.6	78.8	78.9	78.9	78.7	78.5	78.2	77.8	77.4	76.9	76.3	75.8	75.1	74.5	73.8	73.1
90	74.2	74.9	75.4	75.9	76.2	76.4	76.5	76.5	76.5	76.4	76.3	76.1	75.8	75.5	75.2	74.8	74.4	74.0	73.6	73.1
95	73.1	73.3	73.6	73.8	73.9	74.0	74.1	74.2	74.2	74.2	74.2	74.2	74.1	74.0	73.9	73.8	73.6	73.5	73.3	73.1
98	73.1	73.1	73.2	73.2	73.3	73.3	73.3	73.3	73.3	73.3	73.3	73.3	73.3	73.3	73.3	73.2	73.2	73.2	73.1	73.1













### Mean Annual Mass Removal Efficiencies for 0.25-inches of Retention in Zone 2

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	94.4	90.4	83.0	75.1	68.0	61.9	56.6	52.1	48.3	44.9	42.0	39.4	37.2	35.1	33.3	31.7	30.2	28.8	27.6	26.4
35	91.8	88.8	82.0	74.5	67.6	61.5	56.4	51.9	48.1	44.8	41.9	39.4	37.1	35.1	33.3	31.7	30.2	28.8	27.6	26.4
40	88.2	86.6	80.6	73.5	66.9	61.1	56.0	51.7	47.9	44.7	41.8	39.3	37.1	35.0	33.2	31.6	30.2	28.8	27.6	26.4
45	83.9	83.8	78.7	72.3	66.1	60.4	55.6	51.4	47.7	44.5	41.7	39.2	37.0	35.0	33.2	31.6	30.1	28.8	27.6	26.4
50	78.8	80.4	76.4	70.7	64.9	59.6	55.0	50.9	47.3	44.2	41.5	39.0	36.8	34.9	33.1	31.5	30.1	28.8	27.6	26.4
55	73.2	76.4	73.6	68.7	63.5	58.6	54.2	50.3	46.9	43.9	41.2	38.8	36.7	34.8	33.0	31.5	30.1	28.7	27.5	26.4
60	67.4	71.8	70.2	66.3	61.7	57.3	53.2	49.6	46.3	43.4	40.8	38.6	36.5	34.6	32.9	31.4	30.0	28.7	27.5	26.4
65	61.4	66.7	66.3	63.4	59.5	55.6	51.9	48.6	45.5	42.9	40.4	38.2	36.2	34.4	32.8	31.3	29.9	28.7	27.5	26.4
70	55.7	61.1	61.8	59.8	56.8	53.5	50.4	47.3	44.6	42.1	39.8	37.7	35.9	34.1	32.6	31.1	29.8	28.6	27.5	26.4
75	50.1	55.2	56.5	55.6	53.5	50.9	48.3	45.7	43.3	41.1	39.0	37.1	35.4	33.8	32.3	30.9	29.7	28.5	27.4	26.4
80	45.0	49.1	50.7	50.6	49.4	47.6	45.6	43.6	41.6	39.7	37.9	36.2	34.7	33.2	31.9	30.7	29.5	28.4	27.4	26.4
85	40.3	43.2	44.5	44.8	44.3	43.4	42.1	40.7	39.2	37.8	36.3	35.0	33.7	32.5	31.3	30.2	29.2	28.2	27.3	26.4
90	36.0	37.5	38.3	38.6	38.5	38.1	37.5	36.7	35.9	35.0	34.0	33.1	32.2	31.3	30.4	29.5	28.7	27.9	27.2	26.4
95	31.7	32.1	32.3	32.4	32.3	32.2	32.0	31.7	31.4	31.0	30.6	30.2	29.7	29.3	28.8	28.3	27.9	27.4	26.9	26.4
98	29.3	29.3	29.2	29.1	29.0	28.9	28.8	28.6	28.5	28.3	28.2	28.0	27.8	27.7	27.5	27.3	27.1	26.9	26.6	26.4

### Mean Annual Mass Removal Efficiencies for 0.50-inches of Retention in Zone 2

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	97.0	96.7	94.8	91.7	87.9	83.8	79.7	75.7	71.9	68.4	65.2	62.1	59.4	56.9	54.5	52.3	50.3	48.4	46.7	45.1
35	95.2	95.5	93.8	90.9	87.3	83.4	79.3	75.4	71.7	68.3	65.0	62.1	59.3	56.8	54.4	52.3	50.3	48.4	46.7	45.1
40	92.9	94.0	92.5	89.9	86.5	82.7	78.9	75.1	71.4	68.0	64.9	61.9	59.2	56.7	54.4	52.2	50.2	48.4	46.7	45.1
45	90.2	91.9	90.9	88.6	85.5	81.9	78.2	74.6	71.1	67.7	64.6	61.7	59.1	56.6	54.3	52.2	50.2	48.4	46.7	45.1
50	86.7	89.2	88.9	87.0	84.2	80.9	77.4	73.9	70.5	67.3	64.3	61.5	58.9	56.5	54.2	52.1	50.2	48.3	46.6	45.1
55	82.7	86.1	86.4	84.9	82.6	79.6	76.4	73.1	69.9	66.8	63.9	61.2	58.6	56.3	54.1	52.0	50.1	48.3	46.6	45.1
60	78.5	82.6	83.4	82.5	80.6	78.0	75.1	72.1	69.1	66.1	63.4	60.8	58.3	56.0	53.9	51.9	50.0	48.2	46.6	45.1
65	74.2	78.6	79.8	79.5	78.1	76.0	73.5	70.7	68.0	65.3	62.7	60.2	57.9	55.7	53.6	51.7	49.9	48.2	46.6	45.1
70	69.8	74.2	75.8	76.0	75.2	73.5	71.4	69.1	66.6	64.2	61.8	59.5	57.3	55.3	53.3	51.4	49.7	48.1	46.5	45.1
75	65.4	69.6	71.4	71.9	71.5	70.4	68.8	66.9	64.9	62.7	60.6	58.6	56.6	54.7	52.8	51.1	49.5	47.9	46.5	45.1
80	61.4	64.9	66.6	67.3	67.2	66.5	65.5	64.1	62.5	60.8	59.0	57.3	55.5	53.9	52.2	50.7	49.2	47.7	46.4	45.1
85	57.6	60.1	61.6	62.2	62.3	62.0	61.3	60.4	59.3	58.1	56.8	55.4	54.0	52.7	51.3	50.0	48.7	47.4	46.2	45.1
90	54.1	55.4	56.2	56.7	56.8	56.7	56.4	55.9	55.2	54.5	53.6	52.8	51.8	50.9	49.9	48.9	47.9	46.9	46.0	45.1
95	50.1	50.5	50.7	50.8	50.8	50.8	50.6	50.4	50.2	49.9	49.5	49.1	48.7	48.2	47.7	47.2	46.7	46.1	45.6	45.1
98	47.8	47.7	47.7	47.6	47.6	47.5	47.4	47.2	47.1	46.9	46.8	46.6	46.5	46.3	46.1	45.9	45.7	45.5	45.3	45.1

### Mean Annual Mass Removal Efficiencies for 0.75-inches of Retention in Zone 2

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	97.9	98.2	97.5	96.2	94.4	92.1	89.6	86.9	84.1	81.3	78.5	75.9	73.3	70.9	68.5	66.3	64.2	62.2	60.4	58.6
35	96.7	97.3	96.8	95.6	93.8	91.7	89.2	86.6	83.8	81.1	78.4	75.7	73.2	70.8	68.5	66.3	64.2	62.2	60.4	58.6
40	95.0	96.1	95.9	94.8	93.1	91.1	88.7	86.2	83.5	80.8	78.2	75.6	73.1	70.7	68.4	66.2	64.2	62.2	60.4	58.6
45	93.0	94.7	94.6	93.7	92.2	90.3	88.1	85.6	83.1	80.5	77.9	75.4	72.9	70.6	68.3	66.2	64.1	62.2	60.4	58.6
50	90.7	92.8	93.1	92.4	91.1	89.3	87.3	85.0	82.5	80.0	77.5	75.1	72.7	70.4	68.2	66.1	64.0	62.1	60.3	58.6
55	88.0	90.6	91.1	90.7	89.7	88.1	86.3	84.1	81.8	79.4	77.0	74.7	72.4	70.1	68.0	65.9	64.0	62.1	60.3	58.6
60	84.8	87.9	88.8	88.7	88.0	86.7	85.0	83.0	80.9	78.7	76.5	74.2	72.0	69.8	67.8	65.8	63.8	62.0	60.3	58.6
65	81.5	84.9	86.2	86.3	85.8	84.8	83.4	81.7	79.8	77.8	75.7	73.6	71.5	69.5	67.5	65.5	63.7	61.9	60.2	58.6
70	78.1	81.7	83.1	83.5	83.2	82.5	81.4	80.0	78.4	76.6	74.7	72.8	70.9	68.9	67.1	65.2	63.5	61.8	60.2	58.6
75	74.9	78.1	79.6	80.2	80.2	79.8	79.0	77.9	76.5	75.0	73.4	71.7	70.0	68.3	66.5	64.8	63.2	61.6	60.1	58.6
80	71.6	74.3	75.8	76.5	76.7	76.5	76.0	75.2	74.1	73.0	71.7	70.3	68.8	67.3	65.8	64.3	62.8	61.4	60.0	58.6
85	68.6	70.6	71.8	72.5	72.8	72.7	72.4	71.9	71.2	70.3	69.3	68.3	67.1	65.9	64.7	63.5	62.2	61.0	59.8	58.6
90	65.7	66.9	67.7	68.1	68.3	68.3	68.2	67.9	67.5	66.9	66.3	65.6	64.9	64.0	63.2	62.3	61.4	60.5	59.5	58.6
95	62.7	63.0	63.2	63.3	63.4	63.4	63.3	63.2	63.0	62.8	62.5	62.2	61.8	61.4	61.0	60.5	60.1	59.6	59.1	58.6
98	60.8	60.8	60.8	60.7	60.7	60.6	60.5	60.4	60.3	60.2	60.1	59.9	59.8	59.6	59.5	59.3	59.2	59.0	58.8	58.6

### Mean Annual Mass Removal Efficiencies for 1.00-inches of Retention in Zone 2

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	98.5	98.8	98.5	97.9	96.9	95.6	94.1	92.3	90.4	88.4	86.3	84.2	82.1	80.0	77.9	75.9	74.0	72.2	70.3	68.6
35	97.5	98.2	98.0	97.4	96.5	95.3	93.7	92.0	90.2	88.2	86.2	84.1	82.0	79.9	77.9	75.9	74.0	72.1	70.3	68.6
40	96.4	97.3	97.2	96.8	95.9	94.8	93.3	91.7	89.9	87.9	85.9	83.9	81.8	79.8	77.8	75.8	73.9	72.1	70.3	68.6
45	94.8	96.1	96.3	96.0	95.2	94.1	92.7	91.2	89.4	87.6	85.6	83.6	81.6	79.6	77.7	75.8	73.9	72.1	70.3	68.6
50	93.0	94.8	95.2	94.9	94.3	93.3	92.0	90.5	88.9	87.1	85.3	83.3	81.4	79.5	77.5	75.6	73.8	72.0	70.3	68.6
55	91.0	93.2	93.7	93.6	93.1	92.3	91.1	89.8	88.2	86.6	84.8	82.9	81.1	79.2	77.3	75.5	73.7	72.0	70.2	68.6
60	88.8	91.2	92.0	92.0	91.7	91.0	90.0	88.8	87.4	85.9	84.2	82.4	80.7	78.9	77.1	75.3	73.6	71.9	70.2	68.6
65	86.2	88.9	89.9	90.2	90.0	89.5	88.7	87.6	86.4	85.0	83.4	81.8	80.2	78.5	76.8	75.1	73.4	71.8	70.2	68.6
70	83.6	86.4	87.5	88.0	88.0	87.6	86.9	86.1	85.1	83.8	82.5	81.0	79.5	77.9	76.4	74.8	73.2	71.6	70.1	68.6
75	81.0	83.6	84.9	85.5	85.6	85.3	84.9	84.2	83.4	82.4	81.2	80.0	78.6	77.2	75.8	74.3	72.9	71.5	70.0	68.6
80	78.6	80.8	82.0	82.5	82.8	82.7	82.4	81.9	81.3	80.5	79.6	78.5	77.4	76.3	75.0	73.8	72.5	71.2	69.9	68.6
85	76.1	77.7	78.7	79.3	79.6	79.7	79.5	79.2	78.8	78.2	77.5	76.7	75.9	74.9	74.0	72.9	71.9	70.8	69.7	68.6
90	73.9	74.8	75.5	75.9	76.1	76.2	76.2	76.0	75.7	75.3	74.9	74.4	73.8	73.2	72.5	71.8	71.0	70.3	69.4	68.6
95	71.5	71.8	72.0	72.1	72.2	72.2	72.2	72.1	72.0	71.9	71.7	71.4	71.2	70.9	70.6	70.2	69.9	69.5	69.0	68.6
98	70.2	70.2	70.2	70.2	70.1	70.1	70.1	70.0	69.9	69.8	69.7	69.7	69.6	69.4	69.3	69.2	69.0	68.9	68.8	68.6

### Mean Annual Mass Removal Efficiencies for 1.25-inches of Retention in Zone 2

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	98.9	99.1	99.0	98.7	98.1	97.3	96.4	95.2	93.9	92.4	90.9	89.3	87.7	86.0	84.3	82.6	80.9	79.2	77.6	76.0
35	98.1	98.6	98.6	98.3	97.7	97.0	96.1	94.9	93.7	92.3	90.8	89.2	87.6	85.9	84.2	82.5	80.9	79.2	77.6	76.0
40	97.2	98.0	98.0	97.8	97.3	96.6	95.7	94.6	93.4	92.0	90.5	89.0	87.4	85.8	84.1	82.5	80.8	79.2	77.6	76.0
45	96.1	97.1	97.3	97.1	96.7	96.1	95.2	94.2	93.0	91.7	90.3	88.8	87.2	85.6	84.0	82.4	80.7	79.1	77.6	76.0
50	94.7	96.0	96.4	96.3	96.0	95.4	94.6	93.6	92.5	91.3	89.9	88.5	87.0	85.4	83.8	82.2	80.7	79.1	77.5	76.0
55	93.0	94.8	95.3	95.3	95.1	94.6	93.9	93.0	91.9	90.8	89.5	88.1	86.7	85.2	83.6	82.1	80.6	79.0	77.5	76.0
60	91.3	93.3	94.0	94.1	94.0	93.6	92.9	92.2	91.2	90.1	88.9	87.7	86.3	84.9	83.4	81.9	80.4	78.9	77.5	76.0
65	89.4	91.6	92.4	92.7	92.6	92.3	91.8	91.1	90.3	89.3	88.3	87.1	85.8	84.5	83.1	81.7	80.3	78.8	77.4	76.0
70	87.5	89.6	90.6	91.0	91.0	90.8	90.4	89.8	89.1	88.3	87.4	86.3	85.2	83.9	82.7	81.4	80.0	78.7	77.3	76.0
75	85.4	87.4	88.5	89.0	89.1	89.0	88.7	88.3	87.7	87.0	86.2	85.3	84.3	83.3	82.1	80.9	79.7	78.5	77.3	76.0
80	83.4	85.2	86.2	86.7	86.9	86.9	86.7	86.4	86.0	85.5	84.8	84.1	83.3	82.3	81.4	80.4	79.3	78.2	77.1	76.0
85	81.6	82.9	83.7	84.2	84.4	84.5	84.4	84.2	84.0	83.6	83.1	82.5	81.9	81.2	80.4	79.6	78.8	77.9	76.9	76.0
90	79.7	80.5	81.0	81.4	81.6	81.7	81.7	81.7	81.5	81.3	80.9	80.6	80.1	79.7	79.1	78.6	78.0	77.4	76.7	76.0
95	77.9	78.2	78.4	78.5	78.6	78.7	78.7	78.6	78.6	78.4	78.3	78.2	78.0	77.8	77.5	77.3	77.0	76.7	76.3	76.0
98	77.1	77.1	77.1	77.1	77.1	77.1	77.0	77.0	76.9	76.9	76.8	76.8	76.7	76.6	76.5	76.4	76.3	76.2	76.1	76.0

### Mean Annual Mass Removal Efficiencies for 1.50-inches of Retention in Zone 2

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	99.2	99.4	99.3	99.1	98.7	98.2	97.6	96.8	95.9	94.9	93.7	92.5	91.3	89.9	88.6	87.2	85.7	84.3	82.9	81.5
35	98.6	99.0	99.0	98.8	98.5	98.0	97.4	96.6	95.7	94.7	93.6	92.4	91.2	89.8	88.5	87.1	85.7	84.3	82.9	81.5
40	97.8	98.4	98.5	98.4	98.1	97.6	97.1	96.3	95.5	94.5	93.4	92.2	91.0	89.7	88.4	87.1	85.7	84.3	82.9	81.5
45	96.9	97.8	98.0	97.9	97.6	97.2	96.7	96.0	95.1	94.2	93.1	92.0	90.8	89.6	88.3	87.0	85.6	84.2	82.9	81.5
50	95.9	96.9	97.2	97.2	97.0	96.7	96.2	95.5	94.7	93.8	92.8	91.8	90.6	89.4	88.2	86.9	85.5	84.2	82.8	81.5
55	94.6	95.9	96.3	96.4	96.3	96.0	95.6	95.0	94.2	93.4	92.4	91.4	90.3	89.2	88.0	86.7	85.4	84.1	82.8	81.5
60	93.1	94.7	95.3	95.5	95.4	95.2	94.8	94.3	93.6	92.8	92.0	91.0	90.0	88.9	87.7	86.5	85.3	84.0	82.8	81.5
65	91.7	93.4	94.1	94.4	94.4	94.2	93.9	93.4	92.8	92.1	91.3	90.5	89.5	88.5	87.4	86.3	85.1	83.9	82.7	81.5
70	90.1	91.9	92.7	93.0	93.1	93.0	92.7	92.3	91.9	91.2	90.6	89.8	88.9	88.0	87.0	86.0	84.9	83.8	82.6	81.5
75	88.5	90.2	91.0	91.5	91.6	91.6	91.4	91.1	90.7	90.2	89.6	88.9	88.2	87.4	86.5	85.6	84.6	83.6	82.6	81.5
80	86.9	88.4	89.2	89.6	89.9	89.9	89.8	89.6	89.3	88.9	88.4	87.9	87.3	86.6	85.9	85.1	84.2	83.3	82.4	81.5
85	85.4	86.5	87.2	87.6	87.9	88.0	87.9	87.8	87.6	87.3	87.0	86.6	86.1	85.6	85.0	84.4	83.7	83.0	82.3	81.5
90	84.1	84.7	85.1	85.4	85.6	85.7	85.8	85.7	85.6	85.5	85.3	85.0	84.7	84.4	84.0	83.5	83.1	82.6	82.0	81.5
95	82.7	82.9	83.1	83.2	83.3	83.3	83.4	83.4	83.4	83.3	83.2	83.1	83.0	82.8	82.6	82.4	82.2	82.0	81.8	81.5
98	82.2	82.2	82.2	82.2	82.2	82.2	82.2	82.2	82.1	82.1	82.1	82.0	82.0	81.9	81.9	81.8	81.7	81.7	81.6	81.5

### Mean Annual Mass Removal Efficiencies for 1.75-inches of Retention in Zone 2

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	99.4	99.5	99.5	99.4	99.1	98.8	98.3	97.8	97.2	96.4	95.6	94.6	93.6	92.6	91.5	90.4	89.2	88.0	86.8	85.6
35	98.9	99.2	99.2	99.1	98.9	98.6	98.1	97.6	97.0	96.3	95.4	94.5	93.5	92.5	91.4	90.3	89.2	88.0	86.8	85.6
40	98.3	98.8	98.9	98.8	98.6	98.3	97.9	97.4	96.8	96.1	95.3	94.4	93.4	92.4	91.4	90.3	89.1	88.0	86.8	85.6
45	97.5	98.3	98.4	98.4	98.2	97.9	97.5	97.1	96.5	95.8	95.0	94.2	93.2	92.3	91.2	90.2	89.1	87.9	86.8	85.6
50	96.7	97.6	97.8	97.8	97.7	97.5	97.1	96.7	96.2	95.5	94.8	93.9	93.0	92.1	91.1	90.1	89.0	87.9	86.7	85.6
55	95.7	96.8	97.1	97.2	97.1	96.9	96.6	96.2	95.7	95.1	94.4	93.6	92.8	91.9	90.9	89.9	88.9	87.8	86.7	85.6
60	94.5	95.8	96.3	96.4	96.4	96.3	96.0	95.7	95.2	94.6	94.0	93.3	92.5	91.6	90.7	89.8	88.8	87.7	86.7	85.6
65	93.3	94.7	95.3	95.5	95.6	95.5	95.3	95.0	94.5	94.0	93.4	92.8	92.1	91.3	90.4	89.5	88.6	87.6	86.6	85.6
70	92.0	93.5	94.2	94.5	94.6	94.5	94.4	94.1	93.7	93.3	92.8	92.2	91.5	90.8	90.1	89.3	88.4	87.5	86.6	85.6
75	90.8	92.1	92.9	93.2	93.4	93.4	93.3	93.1	92.8	92.4	92.0	91.5	90.9	90.3	89.6	88.9	88.2	87.3	86.5	85.6
80	89.6	90.7	91.4	91.8	92.0	92.0	92.0	91.9	91.6	91.3	91.0	90.6	90.1	89.6	89.1	88.5	87.8	87.1	86.4	85.6
85	88.4	89.2	89.8	90.2	90.4	90.5	90.5	90.4	90.3	90.1	89.8	89.5	89.2	88.8	88.4	87.9	87.4	86.8	86.2	85.6
90	87.3	87.8	88.2	88.4	88.6	88.7	88.8	88.7	88.7	88.6	88.4	88.2	88.0	87.8	87.5	87.2	86.8	86.4	86.0	85.6
95	86.2	86.4	86.6	86.7	86.8	86.8	86.9	86.9	86.9	86.8	86.8	86.7	86.7	86.6	86.4	86.3	86.1	86.0	85.8	85.6
98	86.0	86.0	86.0	86.0	86.1	86.1	86.1	86.0	86.0	86.0	86.0	86.0	85.9	85.9	85.9	85.8	85.8	85.7	85.6	85.6

### Mean Annual Mass Removal Efficiencies for 2.00-inches of Retention in Zone 2

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	99.5	99.7	99.6	99.6	99.4	99.1	98.8	98.4	97.9	97.4	96.8	96.1	95.3	94.4	93.6	92.6	91.7	90.7	89.7	88.7
35	99.2	99.4	99.4	99.4	99.2	99.0	98.6	98.2	97.8	97.3	96.6	95.9	95.2	94.4	93.5	92.6	91.6	90.7	89.7	88.7
40	98.6	99.0	99.1	99.1	98.9	98.7	98.4	98.0	97.6	97.1	96.5	95.8	95.1	94.3	93.4	92.5	91.6	90.6	89.7	88.7
45	98.0	98.6	98.8	98.7	98.6	98.4	98.1	97.8	97.4	96.9	96.3	95.6	94.9	94.1	93.3	92.5	91.5	90.6	89.6	88.7
50	97.3	98.1	98.3	98.3	98.2	98.0	97.8	97.5	97.1	96.6	96.1	95.4	94.7	94.0	93.2	92.4	91.5	90.6	89.6	88.7
55	96.6	97.4	97.7	97.8	97.7	97.6	97.4	97.1	96.7	96.3	95.8	95.2	94.5	93.8	93.0	92.2	91.4	90.5	89.6	88.7
60	95.6	96.6	97.0	97.1	97.1	97.0	96.9	96.6	96.3	95.9	95.4	94.9	94.2	93.6	92.8	92.1	91.3	90.4	89.6	88.7
65	94.5	95.7	96.2	96.4	96.5	96.4	96.3	96.0	95.7	95.4	94.9	94.4	93.9	93.3	92.6	91.9	91.1	90.3	89.5	88.7
70	93.5	94.7	95.3	95.5	95.7	95.6	95.5	95.3	95.1	94.8	94.4	93.9	93.4	92.9	92.3	91.6	90.9	90.2	89.5	88.7
75	92.5	93.6	94.2	94.5	94.7	94.7	94.7	94.5	94.3	94.0	93.7	93.3	92.9	92.4	91.9	91.3	90.7	90.1	89.4	88.7
80	91.5	92.5	93.1	93.4	93.6	93.7	93.6	93.5	93.4	93.2	92.9	92.6	92.2	91.8	91.4	90.9	90.4	89.9	89.3	88.7
85	90.6	91.3	91.8	92.1	92.3	92.4	92.4	92.4	92.3	92.1	91.9	91.7	91.4	91.1	90.8	90.4	90.0	89.6	89.2	88.7
90	89.7	90.1	90.5	90.7	90.9	91.0	91.0	91.0	91.0	90.9	90.8	90.6	90.5	90.3	90.1	89.9	89.6	89.3	89.0	88.7
95	88.9	89.1	89.2	89.3	89.4	89.5	89.5	89.5	89.5	89.5	89.5	89.4	89.4	89.3	89.2	89.2	89.0	88.9	88.8	88.7
98	88.8	88.8	88.9	88.9	88.9	88.9	88.9	88.9	88.9	88.9	88.9	88.9	88.9	88.8	88.8	88.8	88.8	88.7	88.7	88.7

### Mean Annual Mass Removal Efficiencies for 2.25-inches of Retention in Zone 2

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	99.7	99.7	99.7	99.7	99.6	99.4	99.1	98.8	98.5	98.1	97.6	97.0	96.4	95.8	95.0	94.3	93.5	92.7	91.8	91.0
35	99.3	99.5	99.6	99.5	99.4	99.2	99.0	98.7	98.3	97.9	97.5	96.9	96.3	95.7	95.0	94.3	93.5	92.7	91.8	91.0
40	99.0	99.2	99.3	99.3	99.2	99.0	98.8	98.5	98.2	97.8	97.3	96.8	96.2	95.6	94.9	94.2	93.4	92.6	91.8	91.0
45	98.4	98.9	99.0	99.0	98.9	98.8	98.6	98.3	98.0	97.6	97.2	96.7	96.1	95.5	94.8	94.1	93.4	92.6	91.8	91.0
50	97.8	98.5	98.6	98.7	98.6	98.5	98.3	98.0	97.7	97.4	97.0	96.5	95.9	95.4	94.7	94.0	93.3	92.5	91.8	91.0
55	97.2	97.9	98.2	98.2	98.2	98.1	97.9	97.7	97.4	97.1	96.7	96.3	95.8	95.2	94.6	93.9	93.2	92.5	91.7	91.0
60	96.5	97.3	97.6	97.7	97.7	97.6	97.5	97.3	97.0	96.8	96.4	96.0	95.5	95.0	94.4	93.8	93.1	92.4	91.7	91.0
65	95.6	96.5	96.9	97.1	97.1	97.1	97.0	96.8	96.6	96.3	96.0	95.6	95.2	94.7	94.2	93.6	93.0	92.3	91.7	91.0
70	94.6	95.6	96.1	96.3	96.4	96.4	96.4	96.3	96.1	95.8	95.5	95.2	94.8	94.4	93.9	93.4	92.8	92.2	91.6	91.0
75	93.8	94.7	95.2	95.5	95.7	95.7	95.7	95.6	95.4	95.2	95.0	94.7	94.4	94.0	93.6	93.1	92.6	92.1	91.5	91.0
80	93.0	93.8	94.3	94.6	94.8	94.9	94.9	94.8	94.7	94.5	94.3	94.1	93.8	93.5	93.1	92.8	92.4	91.9	91.4	91.0
85	92.3	92.9	93.3	93.6	93.7	93.8	93.9	93.8	93.8	93.7	93.5	93.4	93.1	92.9	92.6	92.4	92.0	91.7	91.3	91.0
90	91.6	92.0	92.3	92.5	92.6	92.7	92.7	92.7	92.7	92.7	92.6	92.5	92.4	92.2	92.1	91.9	91.7	91.5	91.2	91.0
95	91.0	91.2	91.3	91.4	91.4	91.5	91.5	91.5	91.6	91.5	91.5	91.5	91.5	91.4	91.4	91.3	91.2	91.1	91.1	91.0
98	91.0	91.0	91.0	91.0	91.1	91.1	91.1	91.1	91.1	91.1	91.1	91.1	91.1	91.1	91.0	91.0	91.0	91.0	91.0	91.0

### Mean Annual Mass Removal Efficiencies for 2.50-inches of Retention in Zone 2

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	99.7	99.8	99.8	99.8	99.7	99.6	99.4	99.1	98.8	98.5	98.1	97.7	97.2	96.7	96.1	95.5	94.9	94.2	93.5	92.7
35	99.5	99.6	99.7	99.6	99.6	99.4	99.3	99.0	98.7	98.4	98.0	97.6	97.2	96.6	96.1	95.5	94.8	94.2	93.4	92.7
40	99.2	99.4	99.5	99.5	99.4	99.3	99.1	98.9	98.6	98.3	97.9	97.5	97.1	96.6	96.0	95.4	94.8	94.1	93.4	92.7
45	98.7	99.1	99.2	99.2	99.2	99.0	98.9	98.7	98.4	98.1	97.8	97.4	97.0	96.5	95.9	95.4	94.7	94.1	93.4	92.7
50	98.2	98.8	98.9	98.9	98.9	98.8	98.6	98.4	98.2	97.9	97.6	97.2	96.8	96.4	95.8	95.3	94.7	94.1	93.4	92.7
55	97.7	98.3	98.5	98.6	98.5	98.5	98.3	98.1	97.9	97.7	97.4	97.0	96.6	96.2	95.7	95.2	94.6	94.0	93.4	92.7
60	97.1	97.8	98.0	98.1	98.1	98.1	97.9	97.8	97.6	97.4	97.1	96.8	96.4	96.0	95.6	95.1	94.5	93.9	93.3	92.7
65	96.4	97.1	97.5	97.6	97.6	97.6	97.5	97.4	97.2	97.0	96.8	96.5	96.2	95.8	95.4	94.9	94.4	93.9	93.3	92.7
70	95.6	96.4	96.8	97.0	97.1	97.1	97.0	96.9	96.8	96.6	96.4	96.1	95.8	95.5	95.1	94.7	94.2	93.8	93.3	92.7
75	94.8	95.6	96.0	96.3	96.4	96.5	96.4	96.4	96.3	96.1	95.9	95.7	95.5	95.2	94.8	94.5	94.1	93.6	93.2	92.7
80	94.1	94.8	95.3	95.5	95.7	95.8	95.8	95.7	95.7	95.5	95.4	95.2	95.0	94.8	94.5	94.2	93.8	93.5	93.1	92.7
85	93.6	94.1	94.4	94.7	94.8	94.9	95.0	95.0	94.9	94.9	94.7	94.6	94.5	94.3	94.1	93.8	93.6	93.3	93.0	92.7
90	93.1	93.4	93.6	93.8	93.9	94.0	94.1	94.1	94.1	94.0	94.0	93.9	93.8	93.7	93.6	93.4	93.3	93.1	92.9	92.7
95	92.7	92.8	92.9	93.0	93.0	93.1	93.1	93.1	93.1	93.1	93.1	93.1	93.1	93.1	93.0	93.0	92.9	92.9	92.8	92.7
98	92.7	92.7	92.7	92.7	92.7	92.8	92.8	92.8	92.8	92.8	92.8	92.8	92.8	92.8	92.8	92.8	92.7	92.7	92.7	92.7

### Mean Annual Mass Removal Efficiencies for 2.75-inches of Retention in Zone 2

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	99.8	99.9	99.9	99.8	99.8	99.7	99.5	99.4	99.1	98.8	98.5	98.2	97.8	97.4	96.9	96.4	95.9	95.3	94.7	94.1
35	99.6	99.7	99.7	99.7	99.7	99.6	99.4	99.3	99.0	98.8	98.5	98.1	97.8	97.4	96.9	96.4	95.9	95.3	94.7	94.1
40	99.4	99.5	99.6	99.6	99.5	99.4	99.3	99.1	98.9	98.6	98.4	98.0	97.7	97.3	96.8	96.4	95.8	95.3	94.7	94.1
45	99.0	99.3	99.4	99.4	99.3	99.2	99.1	98.9	98.7	98.5	98.2	97.9	97.6	97.2	96.8	96.3	95.8	95.2	94.7	94.1
50	98.6	99.0	99.1	99.2	99.1	99.0	98.9	98.7	98.6	98.3	98.1	97.8	97.5	97.1	96.7	96.2	95.7	95.2	94.7	94.1
55	98.1	98.6	98.8	98.8	98.8	98.7	98.6	98.5	98.3	98.1	97.9	97.6	97.3	97.0	96.6	96.1	95.7	95.2	94.6	94.1
60	97.6	98.2	98.4	98.5	98.5	98.4	98.3	98.2	98.0	97.9	97.6	97.4	97.1	96.8	96.4	96.0	95.6	95.1	94.6	94.1
65	97.0	97.6	97.9	98.0	98.1	98.0	98.0	97.9	97.7	97.6	97.4	97.2	96.9	96.6	96.2	95.9	95.5	95.0	94.6	94.1
70	96.4	97.0	97.3	97.5	97.6	97.6	97.5	97.5	97.4	97.2	97.1	96.9	96.6	96.3	96.0	95.7	95.3	94.9	94.5	94.1
75	95.7	96.4	96.7	96.9	97.0	97.1	97.0	97.0	96.9	96.8	96.7	96.5	96.3	96.1	95.8	95.5	95.2	94.8	94.5	94.1
80	95.1	95.6	96.0	96.3	96.4	96.5	96.5	96.5	96.4	96.3	96.2	96.1	95.9	95.7	95.5	95.3	95.0	94.7	94.4	94.1
85	94.6	95.0	95.3	95.6	95.7	95.8	95.8	95.8	95.8	95.8	95.7	95.6	95.5	95.3	95.2	95.0	94.8	94.6	94.3	94.1
90	94.2	94.5	94.7	94.9	95.0	95.0	95.1	95.1	95.1	95.1	95.1	95.0	94.9	94.9	94.8	94.6	94.5	94.4	94.2	94.1
95	93.9	94.0	94.1	94.2	94.3	94.3	94.3	94.4	94.4	94.4	94.4	94.4	94.4	94.3	94.3	94.3	94.2	94.2	94.1	94.1
98	94.0	94.0	94.0	94.0	94.1	94.1	94.1	94.1	94.1	94.1	94.1	94.1	94.1	94.1	94.1	94.1	94.1	94.1	94.1	94.1

### Mean Annual Mass Removal Efficiencies for 3.00-inches of Retention in Zone 2

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	99.9	99.9	99.9	99.9	99.8	99.8	99.7	99.5	99.3	99.1	98.9	98.6	98.3	97.9	97.6	97.1	96.7	96.2	95.7	95.1
35	99.7	99.8	99.8	99.8	99.7	99.7	99.6	99.4	99.2	99.0	98.8	98.5	98.2	97.9	97.5	97.1	96.7	96.2	95.7	95.1
40	99.5	99.6	99.7	99.7	99.6	99.6	99.5	99.3	99.1	98.9	98.7	98.4	98.1	97.8	97.5	97.1	96.6	96.2	95.7	95.1
45	99.2	99.4	99.5	99.5	99.5	99.4	99.3	99.2	99.0	98.8	98.6	98.3	98.1	97.7	97.4	97.0	96.6	96.1	95.6	95.1
50	98.8	99.2	99.3	99.3	99.3	99.2	99.1	99.0	98.8	98.6	98.4	98.2	97.9	97.6	97.3	96.9	96.5	96.1	95.6	95.1
55	98.4	98.9	99.0	99.1	99.0	99.0	98.9	98.8	98.6	98.5	98.3	98.0	97.8	97.5	97.2	96.9	96.5	96.1	95.6	95.1
60	98.0	98.5	98.7	98.7	98.7	98.7	98.6	98.5	98.4	98.2	98.1	97.9	97.6	97.4	97.1	96.8	96.4	96.0	95.6	95.1
65	97.5	98.0	98.3	98.4	98.4	98.4	98.3	98.2	98.1	98.0	97.8	97.6	97.4	97.2	96.9	96.6	96.3	95.9	95.6	95.1
70	97.0	97.5	97.8	97.9	98.0	98.0	97.9	97.9	97.8	97.7	97.6	97.4	97.2	97.0	96.8	96.5	96.2	95.9	95.5	95.1
75	96.4	97.0	97.2	97.4	97.5	97.5	97.5	97.5	97.4	97.3	97.2	97.1	96.9	96.8	96.5	96.3	96.1	95.8	95.5	95.1
80	95.9	96.3	96.6	96.8	97.0	97.0	97.0	97.0	97.0	96.9	96.9	96.8	96.6	96.5	96.3	96.1	95.9	95.7	95.4	95.1
85	95.4	95.8	96.1	96.2	96.4	96.5	96.5	96.5	96.5	96.5	96.4	96.3	96.3	96.1	96.0	95.9	95.7	95.5	95.3	95.1
90	95.1	95.4	95.5	95.7	95.8	95.9	95.9	95.9	95.9	95.9	95.9	95.9	95.8	95.8	95.7	95.6	95.5	95.4	95.3	95.1
95	95.0	95.0	95.1	95.2	95.2	95.3	95.3	95.3	95.3	95.4	95.4	95.4	95.3	95.3	95.3	95.3	95.3	95.2	95.2	95.1
98	95.0	95.1	95.1	95.1	95.1	95.1	95.1	95.1	95.1	95.1	95.2	95.2	95.2	95.2	95.2	95.2	95.1	95.1	95.1	95.1

### Mean Annual Mass Removal Efficiencies for 3.25-inches of Retention in Zone 2

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	99.9	99.9	99.9	99.9	99.9	99.8	99.8	99.6	99.5	99.3	99.1	98.9	98.6	98.3	98.0	97.7	97.3	96.9	96.4	96.0
35	99.8	99.8	99.9	99.8	99.8	99.8	99.7	99.6	99.4	99.2	99.0	98.8	98.5	98.3	98.0	97.6	97.3	96.9	96.4	96.0
40	99.6	99.7	99.7	99.7	99.7	99.7	99.6	99.5	99.3	99.1	99.0	98.7	98.5	98.2	97.9	97.6	97.2	96.8	96.4	96.0
45	99.4	99.5	99.6	99.6	99.6	99.5	99.4	99.3	99.2	99.0	98.8	98.6	98.4	98.2	97.9	97.5	97.2	96.8	96.4	96.0
50	99.1	99.3	99.4	99.4	99.4	99.4	99.3	99.2	99.1	98.9	98.7	98.5	98.3	98.1	97.8	97.5	97.2	96.8	96.4	96.0
55	98.7	99.1	99.2	99.2	99.2	99.2	99.1	99.0	98.9	98.7	98.6	98.4	98.2	98.0	97.7	97.4	97.1	96.8	96.4	96.0
60	98.4	98.8	98.9	99.0	99.0	98.9	98.9	98.8	98.7	98.5	98.4	98.2	98.0	97.8	97.6	97.3	97.0	96.7	96.4	96.0
65	98.0	98.4	98.6	98.6	98.7	98.6	98.6	98.5	98.4	98.3	98.2	98.0	97.9	97.7	97.5	97.2	96.9	96.7	96.3	96.0
70	97.5	97.9	98.2	98.3	98.3	98.3	98.3	98.2	98.2	98.1	98.0	97.8	97.7	97.5	97.3	97.1	96.8	96.6	96.3	96.0
75	97.0	97.4	97.7	97.8	97.9	97.9	97.9	97.9	97.8	97.8	97.7	97.6	97.4	97.3	97.1	96.9	96.7	96.5	96.3	96.0
80	96.5	96.9	97.2	97.3	97.4	97.5	97.5	97.5	97.5	97.4	97.4	97.3	97.2	97.1	96.9	96.8	96.6	96.4	96.2	96.0
85	96.1	96.4	96.7	96.8	96.9	97.0	97.0	97.1	97.1	97.0	97.0	96.9	96.9	96.8	96.7	96.6	96.4	96.3	96.1	96.0
90	95.9	96.1	96.2	96.3	96.4	96.5	96.5	96.6	96.6	96.6	96.6	96.6	96.5	96.5	96.4	96.3	96.3	96.2	96.1	96.0
95	95.8	95.8	95.9	96.0	96.0	96.0	96.1	96.1	96.1	96.1	96.1	96.1	96.1	96.1	96.1	96.1	96.1	96.0	96.0	96.0
98	95.9	95.9	95.9	95.9	95.9	95.9	95.9	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0

### Mean Annual Mass Removal Efficiencies for 3.50-inches of Retention in Zone 2

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	99.9	99.9	99.9	99.9	99.9	99.9	99.8	99.7	99.6	99.5	99.3	99.1	98.9	98.6	98.4	98.1	97.8	97.4	97.0	96.7
35	99.8	99.9	99.9	99.9	99.8	99.8	99.8	99.7	99.5	99.4	99.2	99.0	98.8	98.6	98.3	98.0	97.7	97.4	97.0	96.7
40	99.7	99.8	99.8	99.8	99.8	99.7	99.7	99.6	99.5	99.3	99.2	99.0	98.8	98.5	98.3	98.0	97.7	97.4	97.0	96.7
45	99.5	99.7	99.7	99.7	99.7	99.6	99.6	99.5	99.4	99.2	99.1	98.9	98.7	98.5	98.2	98.0	97.7	97.4	97.0	96.7
50	99.3	99.5	99.5	99.5	99.5	99.5	99.4	99.3	99.2	99.1	98.9	98.8	98.6	98.4	98.2	97.9	97.6	97.3	97.0	96.7
55	98.9	99.2	99.3	99.4	99.4	99.3	99.3	99.2	99.1	99.0	98.8	98.7	98.5	98.3	98.1	97.9	97.6	97.3	97.0	96.7
60	98.6	99.0	99.1	99.2	99.2	99.1	99.1	99.0	98.9	98.8	98.7	98.5	98.4	98.2	98.0	97.8	97.5	97.3	97.0	96.7
65	98.3	98.7	98.8	98.9	98.9	98.9	98.8	98.8	98.7	98.6	98.5	98.4	98.2	98.1	97.9	97.7	97.5	97.2	96.9	96.7
70	97.9	98.3	98.5	98.5	98.6	98.6	98.6	98.5	98.4	98.4	98.3	98.2	98.0	97.9	97.7	97.6	97.4	97.2	96.9	96.7
75	97.5	97.8	98.1	98.2	98.2	98.3	98.2	98.2	98.2	98.1	98.0	97.9	97.8	97.7	97.6	97.4	97.3	97.1	96.9	96.7
80	97.1	97.4	97.6	97.7	97.8	97.9	97.9	97.9	97.9	97.8	97.8	97.7	97.6	97.5	97.4	97.3	97.2	97.0	96.8	96.7
85	96.7	97.0	97.1	97.3	97.4	97.4	97.5	97.5	97.5	97.5	97.5	97.4	97.4	97.3	97.2	97.1	97.0	96.9	96.8	96.7
90	96.5	96.6	96.8	96.9	97.0	97.0	97.1	97.1	97.1	97.1	97.1	97.1	97.1	97.0	97.0	96.9	96.9	96.8	96.7	96.7
95	96.4	96.5	96.5	96.6	96.6	96.7	96.7	96.7	96.7	96.7	96.7	96.7	96.8	96.8	96.8	96.8	96.7	96.7	96.7	96.7
98	96.5	96.5	96.5	96.6	96.6	96.6	96.6	96.6	96.6	96.6	96.6	96.6	96.6	96.6	96.6	96.6	96.7	96.7	96.7	96.7





### Mean Annual Mass Removal Efficiencies for 0.25-inches of Retention for Zone 3

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	82.7	81.2	75.5	69.3	63.6	58.6	54.2	50.4	47.0	44.1	41.4	39.1	37.1	35.2	33.5	32.0	30.6	29.3	28.1	27.0
35	77.8	78.2	73.6	68.0	62.7	58.0	53.7	50.0	46.8	43.9	41.3	39.0	37.0	35.1	33.4	31.9	30.5	29.2	28.1	27.0
40	72.7	74.9	71.5	66.6	61.7	57.2	53.2	49.6	46.4	43.6	41.1	38.9	36.8	35.0	33.4	31.9	30.5	29.2	28.1	27.0
45	67.3	71.3	69.0	64.9	60.5	56.3	52.5	49.1	46.0	43.3	40.9	38.7	36.7	34.9	33.3	31.8	30.5	29.2	28.1	27.0
50	61.8	67.4	66.3	62.9	59.1	55.3	51.7	48.5	45.6	42.9	40.6	38.5	36.5	34.8	33.2	31.7	30.4	29.2	28.0	27.0
55	56.5	63.2	63.2	60.7	57.4	54.0	50.8	47.8	45.0	42.5	40.2	38.2	36.3	34.6	33.1	31.7	30.4	29.1	28.0	27.0
60	51.5	58.8	59.9	58.2	55.5	52.6	49.7	46.9	44.3	42.0	39.8	37.9	36.1	34.4	32.9	31.6	30.3	29.1	28.0	27.0
65	46.7	54.3	56.2	55.4	53.4	50.9	48.3	45.9	43.5	41.3	39.3	37.5	35.8	34.2	32.8	31.4	30.2	29.0	28.0	27.0
70	42.4	49.7	52.3	52.2	50.8	48.9	46.8	44.6	42.5	40.5	38.7	37.0	35.4	33.9	32.5	31.3	30.1	29.0	28.0	27.0
75	38.8	45.1	48.0	48.6	47.9	46.5	44.8	43.1	41.3	39.5	37.9	36.3	34.9	33.5	32.2	31.1	29.9	28.9	27.9	27.0
80	35.5	40.7	43.4	44.5	44.4	43.7	42.5	41.1	39.7	38.3	36.9	35.5	34.2	33.0	31.9	30.8	29.7	28.8	27.9	27.0
85	32.7	36.5	38.7	39.9	40.3	40.1	39.5	38.6	37.6	36.5	35.4	34.4	33.3	32.3	31.3	30.4	29.5	28.6	27.8	27.0
90	30.6	32.8	34.3	35.2	35.7	35.8	35.6	35.2	34.7	34.1	33.4	32.7	31.9	31.2	30.4	29.7	29.0	28.3	27.6	27.0
95	29.1	29.8	30.3	30.7	30.9	31.0	31.0	31.0	30.8	30.6	30.3	30.0	29.7	29.4	29.0	28.6	28.2	27.8	27.4	27.0
98	28.5	28.5	28.6	28.6	28.6	28.6	28.6	28.5	28.5	28.4	28.3	28.2	28.0	27.9	27.8	27.6	27.5	27.3	27.2	27.0

### Mean Annual Mass Removal Efficiencies for 0.50-inches of Retention for Zone 3

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	87.6	89.1	87.6	84.8	81.5	77.8	74.3	70.9	67.8	64.9	62.1	59.6	57.2	55.0	52.9	51.0	49.2	47.6	46.0	44.5
35	83.5	86.5	85.6	83.4	80.4	77.0	73.6	70.4	67.4	64.5	61.9	59.4	57.0	54.9	52.8	51.0	49.2	47.5	46.0	44.5
40	79.3	83.5	83.4	81.7	79.1	76.0	72.9	69.8	66.9	64.2	61.6	59.1	56.9	54.7	52.7	50.9	49.1	47.5	46.0	44.5
45	74.9	80.3	80.9	79.7	77.6	74.9	72.0	69.1	66.4	63.7	61.2	58.9	56.6	54.6	52.6	50.8	49.1	47.5	45.9	44.5
50	70.5	76.7	78.1	77.6	75.9	73.5	70.9	68.3	65.7	63.2	60.8	58.5	56.4	54.4	52.5	50.7	49.0	47.4	45.9	44.5
55	66.3	72.9	75.0	75.1	73.9	71.9	69.6	67.3	64.9	62.6	60.3	58.1	56.1	54.1	52.3	50.6	48.9	47.4	45.9	44.5
60	62.1	68.9	71.7	72.4	71.6	70.1	68.2	66.1	64.0	61.8	59.7	57.7	55.7	53.8	52.1	50.4	48.8	47.3	45.9	44.5
65	58.0	64.9	68.1	69.3	69.1	68.0	66.5	64.7	62.8	60.9	59.0	57.1	55.2	53.5	51.8	50.2	48.7	47.2	45.8	44.5
70	54.4	60.9	64.2	65.8	66.2	65.6	64.5	63.0	61.5	59.8	58.1	56.3	54.6	53.0	51.4	49.9	48.5	47.1	45.8	44.5
75	51.1	57.0	60.4	62.2	62.9	62.7	62.1	61.0	59.8	58.4	56.9	55.4	53.9	52.4	51.0	49.6	48.3	47.0	45.7	44.5
80	48.5	53.5	56.5	58.3	59.1	59.3	59.1	58.5	57.6	56.6	55.4	54.2	52.9	51.6	50.4	49.2	47.9	46.8	45.6	44.5
85	46.7	50.3	52.7	54.2	55.1	55.5	55.6	55.3	54.9	54.2	53.4	52.6	51.6	50.6	49.6	48.5	47.5	46.5	45.5	44.5
90	45.4	47.6	49.1	50.2	51.0	51.4	51.7	51.7	51.5	51.2	50.8	50.3	49.7	49.0	48.3	47.6	46.8	46.1	45.3	44.5
95	44.8	45.6	46.2	46.7	47.1	47.3	47.5	47.6	47.6	47.5	47.4	47.2	47.0	46.7	46.4	46.1	45.7	45.3	44.9	44.5
98	45.2	45.3	45.4	45.4	45.5	45.5	45.5	45.6	45.5	45.5	45.5	45.4	45.3	45.3	45.2	45.0	44.9	44.8	44.7	44.5

**Mean Annual Mass Removal Efficiencies for 0.75-inches of Retention for Zone 3**

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	89.7	92.3	91.6	90.3	88.4	86.2	83.8	81.3	78.7	76.2	73.8	71.5	69.3	67.3	65.3	63.4	61.6	59.9	58.3	56.7
35	86.6	89.8	89.8	88.9	87.2	85.3	83.1	80.7	78.2	75.8	73.5	71.3	69.2	67.1	65.2	63.3	61.6	59.9	58.3	56.7
40	82.9	87.1	87.9	87.3	85.9	84.2	82.2	80.0	77.7	75.4	73.2	71.0	69.0	67.0	65.1	63.2	61.5	59.8	58.2	56.7
45	79.3	84.4	85.7	85.5	84.5	83.0	81.2	79.2	77.1	74.9	72.8	70.7	68.7	66.8	64.9	63.1	61.4	59.8	58.2	56.7
50	75.8	81.4	83.2	83.5	82.8	81.6	80.1	78.3	76.3	74.3	72.3	70.3	68.4	66.5	64.7	63.0	61.3	59.7	58.2	56.7
55	72.2	78.3	80.5	81.2	80.9	80.1	78.8	77.2	75.4	73.5	71.7	69.8	68.0	66.2	64.5	62.8	61.2	59.7	58.2	56.7
60	69.0	75.0	77.6	78.6	78.7	78.3	77.3	75.9	74.3	72.7	71.0	69.2	67.5	65.9	64.2	62.6	61.1	59.6	58.1	56.7
65	65.7	71.6	74.4	75.8	76.3	76.2	75.5	74.4	73.1	71.7	70.1	68.6	67.0	65.4	63.9	62.4	60.9	59.5	58.1	56.7
70	62.5	68.2	71.2	72.8	73.6	73.8	73.4	72.7	71.6	70.4	69.1	67.7	66.3	64.9	63.5	62.1	60.7	59.3	58.0	56.7
75	59.8	64.9	67.9	69.7	70.6	71.1	71.0	70.6	69.8	68.9	67.8	66.7	65.5	64.2	62.9	61.7	60.4	59.2	57.9	56.7
80	57.5	61.8	64.6	66.4	67.5	68.1	68.2	68.0	67.6	67.0	66.2	65.3	64.3	63.3	62.2	61.2	60.0	58.9	57.8	56.7
85	56.0	59.3	61.6	63.1	64.2	64.8	65.1	65.1	64.9	64.6	64.1	63.5	62.8	62.1	61.3	60.4	59.5	58.6	57.7	56.7
90	55.4	57.4	58.9	60.0	60.8	61.3	61.7	61.9	61.9	61.8	61.6	61.3	60.9	60.5	59.9	59.4	58.8	58.1	57.4	56.7
95	55.5	56.2	56.8	57.3	57.7	58.1	58.3	58.5	58.6	58.7	58.7	58.6	58.5	58.4	58.2	57.9	57.7	57.4	57.1	56.7
98	56.5	56.6	56.8	56.9	57.0	57.1	57.1	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.1	57.1	57.0	56.9	56.8	56.7

**Mean Annual Mass Removal Efficiencies for 1.00-inches of Retention for Zone 3**

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	91.1	93.7	94.0	92.9	91.7	90.3	88.6	86.8	85.0	83.1	81.1	79.1	77.2	75.3	73.5	71.8	70.1	68.5	67.0	65.5
35	88.6	91.8	92.2	91.6	90.7	89.5	87.9	86.3	84.5	82.7	80.8	78.9	77.0	75.2	73.4	71.7	70.1	68.5	67.0	65.5
40	85.9	89.4	90.4	90.3	89.6	88.5	87.1	85.6	83.9	82.2	80.4	78.6	76.8	75.0	73.3	71.6	70.0	68.5	66.9	65.5
45	82.5	86.9	88.5	88.7	88.2	87.3	86.1	84.8	83.3	81.7	80.0	78.2	76.5	74.8	73.1	71.5	69.9	68.4	66.9	65.5
50	79.4	84.4	86.4	86.9	86.7	86.0	85.0	83.9	82.5	81.0	79.4	77.8	76.1	74.5	72.9	71.3	69.8	68.3	66.9	65.5
55	76.6	81.9	84.0	84.9	85.0	84.5	83.7	82.8	81.6	80.3	78.8	77.3	75.7	74.2	72.7	71.2	69.7	68.3	66.9	65.5
60	73.8	79.1	81.6	82.7	83.0	82.8	82.3	81.6	80.6	79.4	78.1	76.7	75.2	73.8	72.4	70.9	69.5	68.2	66.8	65.5
65	71.1	76.4	78.9	80.3	80.8	80.9	80.6	80.1	79.4	78.4	77.2	75.9	74.6	73.3	72.0	70.7	69.4	68.0	66.8	65.5
70	68.6	73.5	76.2	77.6	78.4	78.8	78.7	78.5	77.9	77.1	76.2	75.1	73.9	72.8	71.5	70.3	69.1	67.9	66.7	65.5
75	66.3	70.6	73.3	74.9	75.9	76.4	76.6	76.5	76.1	75.6	74.9	74.0	73.0	72.0	71.0	69.9	68.8	67.7	66.6	65.5
80	64.3	68.0	70.5	72.1	73.2	73.9	74.2	74.3	74.1	73.8	73.3	72.6	71.9	71.1	70.2	69.3	68.4	67.5	66.5	65.5
85	63.1	65.9	67.9	69.4	70.4	71.2	71.6	71.8	71.8	71.6	71.3	70.9	70.5	69.9	69.3	68.6	67.9	67.1	66.3	65.5
90	62.7	64.5	65.9	67.0	67.8	68.4	68.8	69.1	69.2	69.2	69.1	68.9	68.7	68.4	68.0	67.6	67.1	66.6	66.1	65.5
95	63.3	64.0	64.6	65.1	65.5	65.8	66.1	66.3	66.4	66.5	66.6	66.6	66.6	66.5	66.4	66.3	66.1	66.0	65.7	65.5
98	64.7	64.8	65.0	65.1	65.2	65.3	65.4	65.5	65.5	65.6	65.6	65.6	65.6	65.7	65.7	65.6	65.6	65.6	65.5	65.5

**Mean Annual Mass Removal Efficiencies for 1.25-inches of Retention for Zone 3**

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	92.1	94.5	95.2	94.8	93.7	92.7	91.5	90.2	88.7	87.3	85.7	84.2	82.6	81.0	79.4	77.8	76.3	74.8	73.4	72.0
35	90.0	92.9	93.9	93.5	92.7	91.9	90.8	89.6	88.2	86.9	85.4	83.9	82.4	80.8	79.3	77.7	76.2	74.8	73.4	72.0
40	87.8	91.2	92.2	92.2	91.7	91.0	90.1	89.0	87.7	86.4	85.0	83.6	82.1	80.6	79.1	77.6	76.2	74.7	73.3	72.0
45	85.4	89.0	90.3	90.7	90.5	90.0	89.2	88.2	87.0	85.9	84.6	83.2	81.8	80.4	78.9	77.5	76.1	74.7	73.3	72.0
50	82.3	86.7	88.4	89.2	89.2	88.9	88.2	87.3	86.3	85.2	84.1	82.8	81.5	80.1	78.7	77.3	75.9	74.6	73.3	72.0
55	79.7	84.4	86.6	87.4	87.6	87.5	87.0	86.3	85.4	84.5	83.5	82.3	81.1	79.8	78.4	77.1	75.8	74.5	73.2	72.0
60	77.4	82.3	84.4	85.5	85.9	86.0	85.7	85.1	84.4	83.7	82.8	81.7	80.6	79.4	78.1	76.9	75.6	74.4	73.2	72.0
65	75.3	79.8	82.2	83.4	84.1	84.2	84.1	83.8	83.3	82.7	81.9	81.0	80.0	78.9	77.8	76.6	75.4	74.3	73.1	72.0
70	73.1	77.5	79.9	81.3	82.0	82.3	82.4	82.3	82.0	81.5	80.9	80.1	79.3	78.3	77.3	76.3	75.2	74.1	73.1	72.0
75	71.2	75.1	77.4	78.9	79.7	80.3	80.5	80.6	80.4	80.1	79.7	79.1	78.4	77.6	76.7	75.8	74.9	73.9	73.0	72.0
80	69.6	72.8	75.0	76.4	77.4	78.1	78.5	78.7	78.7	78.5	78.2	77.8	77.3	76.7	76.0	75.2	74.5	73.7	72.8	72.0
85	68.5	71.0	72.9	74.2	75.1	75.8	76.3	76.6	76.7	76.7	76.6	76.3	76.0	75.5	75.1	74.5	73.9	73.3	72.7	72.0
90	68.4	69.9	71.2	72.2	73.0	73.6	74.0	74.3	74.5	74.6	74.6	74.6	74.4	74.2	73.9	73.6	73.3	72.9	72.4	72.0
95	69.3	70.0	70.5	71.0	71.4	71.7	72.0	72.2	72.4	72.5	72.6	72.6	72.6	72.6	72.6	72.5	72.4	72.3	72.2	72.0
98	70.9	71.0	71.2	71.3	71.4	71.5	71.6	71.7	71.8	71.8	71.9	71.9	72.0	72.0	72.0	72.0	72.0	72.0	72.0	72.0

**Mean Annual Mass Removal Efficiencies for 1.50-inches of Retention for Zone 3**

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	92.8	95.2	95.9	95.9	95.3	94.3	93.3	92.3	91.2	90.1	88.8	87.6	86.3	84.9	83.6	82.3	80.9	79.6	78.2	77.0
35	91.0	93.8	94.7	94.9	94.3	93.5	92.7	91.8	90.8	89.7	88.5	87.3	86.0	84.8	83.5	82.2	80.8	79.5	78.2	77.0
40	89.1	92.3	93.5	93.6	93.3	92.7	92.0	91.2	90.3	89.2	88.1	87.0	85.8	84.6	83.3	82.0	80.8	79.5	78.2	77.0
45	87.2	90.7	91.9	92.2	92.1	91.8	91.2	90.5	89.7	88.7	87.7	86.6	85.5	84.3	83.1	81.9	80.7	79.4	78.2	77.0
50	85.1	88.6	90.1	90.7	90.9	90.7	90.4	89.7	89.0	88.1	87.1	86.2	85.1	84.0	82.9	81.7	80.5	79.3	78.1	77.0
55	82.4	86.5	88.3	89.2	89.6	89.6	89.3	88.8	88.2	87.4	86.6	85.7	84.7	83.7	82.7	81.5	80.4	79.2	78.1	77.0
60	80.2	84.5	86.6	87.7	88.1	88.2	88.1	87.7	87.2	86.6	85.9	85.1	84.3	83.3	82.4	81.3	80.2	79.1	78.0	77.0
65	78.4	82.6	84.7	85.9	86.5	86.7	86.7	86.5	86.1	85.6	85.1	84.4	83.7	82.9	82.0	81.0	80.0	79.0	78.0	77.0
70	76.7	80.6	82.7	84.0	84.7	85.1	85.2	85.1	84.9	84.6	84.1	83.6	83.0	82.3	81.5	80.7	79.8	78.8	77.9	77.0
75	75.1	78.5	80.7	82.0	82.8	83.3	83.5	83.6	83.5	83.3	83.1	82.7	82.2	81.6	81.0	80.3	79.5	78.6	77.8	77.0
80	73.8	76.7	78.6	79.9	80.7	81.3	81.7	81.9	82.0	82.0	81.8	81.6	81.2	80.8	80.3	79.7	79.1	78.4	77.7	77.0
85	72.9	75.1	76.7	77.9	78.8	79.4	79.9	80.2	80.3	80.4	80.4	80.3	80.1	79.8	79.5	79.0	78.6	78.1	77.5	77.0
90	72.9	74.3	75.4	76.3	77.0	77.6	78.0	78.4	78.6	78.7	78.8	78.8	78.8	78.6	78.5	78.2	78.0	77.7	77.3	77.0
95	74.0	74.6	75.1	75.5	75.9	76.2	76.5	76.8	77.0	77.1	77.2	77.3	77.3	77.3	77.3	77.3	77.2	77.2	77.1	77.0
98	75.8	75.9	76.0	76.2	76.3	76.4	76.4	76.5	76.6	76.7	76.7	76.8	76.8	76.9	76.9	76.9	76.9	76.9	77.0	77.0

**Mean Annual Mass Removal Efficiencies for 1.75-inches of Retention for Zone 3**

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	93.3	95.6	96.4	96.6	96.3	95.6	94.7	93.8	92.9	92.0	91.0	89.9	88.8	87.8	86.6	85.5	84.3	83.2	82.0	80.8
35	91.8	94.4	95.4	95.7	95.5	94.8	94.1	93.3	92.5	91.6	90.7	89.7	88.6	87.6	86.5	85.4	84.3	83.1	82.0	80.8
40	90.2	93.1	94.3	94.7	94.5	94.0	93.4	92.7	92.0	91.2	90.4	89.4	88.4	87.4	86.3	85.3	84.2	83.1	82.0	80.8
45	88.6	91.8	93.1	93.5	93.4	93.1	92.6	92.1	91.5	90.8	89.9	89.0	88.1	87.1	86.2	85.1	84.1	83.0	81.9	80.8
50	86.9	90.3	91.6	92.1	92.2	92.1	91.8	91.4	90.9	90.2	89.5	88.6	87.7	86.9	85.9	85.0	84.0	82.9	81.9	80.8
55	84.9	88.3	89.9	90.6	91.0	91.1	90.9	90.6	90.2	89.6	88.9	88.1	87.4	86.6	85.7	84.8	83.8	82.9	81.9	80.8
60	82.7	86.4	88.2	89.2	89.7	89.9	89.9	89.7	89.3	88.8	88.2	87.6	86.9	86.2	85.4	84.6	83.7	82.8	81.8	80.8
65	80.9	84.6	86.7	87.7	88.4	88.6	88.7	88.6	88.3	87.9	87.5	86.9	86.4	85.7	85.0	84.3	83.5	82.6	81.8	80.8
70	79.6	83.0	85.0	86.2	86.8	87.2	87.4	87.4	87.2	87.0	86.6	86.2	85.7	85.2	84.6	84.0	83.2	82.5	81.7	80.8
75	78.3	81.4	83.2	84.4	85.2	85.7	85.9	86.0	86.0	85.8	85.6	85.3	85.0	84.6	84.1	83.5	82.9	82.3	81.6	80.8
80	77.2	79.8	81.5	82.7	83.5	84.0	84.3	84.5	84.6	84.6	84.5	84.4	84.1	83.8	83.5	83.1	82.6	82.0	81.5	80.8
85	76.6	78.5	79.9	80.9	81.7	82.2	82.7	83.0	83.2	83.3	83.3	83.3	83.2	83.0	82.8	82.5	82.1	81.7	81.3	80.8
90	76.4	77.7	78.7	79.5	80.2	80.7	81.1	81.4	81.7	81.9	82.0	82.1	82.1	82.0	81.9	81.8	81.6	81.4	81.1	80.8
95	77.6	78.1	78.6	79.0	79.4	79.7	80.0	80.3	80.5	80.6	80.8	80.9	80.9	81.0	81.0	81.0	81.0	81.0	80.9	80.8
98	79.5	79.7	79.8	79.9	80.0	80.1	80.2	80.3	80.4	80.5	80.5	80.6	80.6	80.7	80.7	80.8	80.8	80.8	80.8	80.8

**Mean Annual Mass Removal Efficiencies for 2.00-inches of Retention for Zone 3**

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	93.8	95.9	96.7	97.0	97.0	96.6	95.8	95.0	94.2	93.4	92.6	91.7	90.8	89.8	88.9	87.9	86.9	85.9	84.9	83.9
35	92.4	94.9	95.8	96.2	96.3	95.9	95.2	94.5	93.8	93.1	92.3	91.5	90.6	89.7	88.7	87.8	86.8	85.9	84.9	83.9
40	91.0	93.8	94.9	95.4	95.4	95.1	94.5	93.9	93.3	92.7	92.0	91.2	90.4	89.5	88.6	87.7	86.8	85.8	84.8	83.9
45	89.7	92.7	93.9	94.5	94.4	94.2	93.8	93.3	92.8	92.3	91.6	90.9	90.1	89.2	88.4	87.6	86.7	85.8	84.8	83.9
50	88.2	91.4	92.8	93.3	93.3	93.3	93.0	92.7	92.3	91.8	91.2	90.5	89.8	89.0	88.2	87.4	86.6	85.7	84.8	83.9
55	86.9	90.0	91.3	91.9	92.2	92.2	92.2	91.9	91.6	91.2	90.7	90.1	89.4	88.7	87.9	87.2	86.4	85.6	84.7	83.9
60	85.0	88.2	89.7	90.6	91.0	91.2	91.2	91.1	90.9	90.5	90.1	89.6	88.9	88.3	87.7	87.0	86.3	85.5	84.7	83.9
65	83.2	86.4	88.2	89.2	89.8	90.1	90.2	90.2	90.0	89.7	89.4	88.9	88.4	87.9	87.3	86.7	86.1	85.4	84.6	83.9
70	81.7	85.0	86.7	87.8	88.5	88.9	89.1	89.1	89.1	88.8	88.6	88.2	87.8	87.4	86.9	86.4	85.8	85.2	84.6	83.9
75	80.8	83.5	85.3	86.4	87.1	87.6	87.9	88.0	87.9	87.9	87.7	87.4	87.1	86.8	86.4	86.0	85.6	85.0	84.5	83.9
80	80.0	82.3	83.8	84.9	85.6	86.2	86.5	86.6	86.7	86.8	86.7	86.6	86.4	86.2	85.9	85.6	85.2	84.8	84.4	83.9
85	79.5	81.2	82.5	83.4	84.1	84.6	85.0	85.3	85.5	85.6	85.6	85.6	85.5	85.4	85.3	85.1	84.9	84.6	84.2	83.9
90	79.5	80.6	81.5	82.2	82.8	83.3	83.6	83.9	84.2	84.3	84.5	84.6	84.6	84.6	84.6	84.5	84.4	84.3	84.1	83.9
95	80.6	81.1	81.5	81.9	82.2	82.5	82.8	83.0	83.2	83.4	83.5	83.6	83.7	83.8	83.9	83.9	83.9	83.9	83.9	83.9
98	82.4	82.6	82.7	82.8	82.9	83.1	83.2	83.2	83.3	83.4	83.5	83.5	83.6	83.7	83.7	83.7	83.8	83.8	83.9	83.9

**Mean Annual Mass Removal Efficiencies for 2.25-inches of Retention for Zone 3**

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	94.1	96.2	97.0	97.3	97.4	97.2	96.7	96.0	95.2	94.5	93.8	93.0	92.3	91.5	90.6	89.8	88.9	88.0	87.1	86.2
35	92.9	95.3	96.2	96.6	96.8	96.6	96.1	95.5	94.8	94.2	93.5	92.8	92.1	91.3	90.5	89.7	88.8	88.0	87.1	86.2
40	91.7	94.3	95.4	95.9	96.1	95.9	95.5	95.0	94.4	93.8	93.2	92.5	91.9	91.1	90.4	89.5	88.7	87.9	87.1	86.2
45	90.6	93.3	94.6	95.1	95.3	95.1	94.8	94.4	93.9	93.4	92.8	92.2	91.6	90.9	90.2	89.4	88.6	87.9	87.1	86.2
50	89.4	92.3	93.6	94.2	94.3	94.2	94.0	93.7	93.3	92.9	92.5	91.9	91.3	90.7	90.0	89.3	88.5	87.8	87.0	86.2
55	88.2	91.2	92.5	93.1	93.3	93.3	93.2	93.0	92.7	92.4	92.0	91.5	91.0	90.4	89.7	89.1	88.4	87.7	87.0	86.2
60	87.0	89.7	91.1	91.8	92.1	92.3	92.3	92.2	92.0	91.8	91.5	91.0	90.6	90.1	89.5	88.9	88.2	87.6	86.9	86.2
65	85.3	88.1	89.6	90.5	91.0	91.3	91.4	91.4	91.3	91.1	90.9	90.5	90.1	89.7	89.1	88.6	88.1	87.5	86.9	86.2
70	83.8	86.6	88.2	89.2	89.8	90.2	90.4	90.5	90.5	90.4	90.2	89.9	89.6	89.2	88.8	88.3	87.9	87.4	86.8	86.2
75	82.9	85.3	86.9	87.9	88.6	89.1	89.3	89.5	89.6	89.5	89.4	89.2	89.0	88.7	88.3	88.0	87.6	87.2	86.7	86.2
80	82.2	84.3	85.7	86.7	87.4	87.9	88.2	88.4	88.5	88.5	88.5	88.4	88.3	88.1	87.8	87.6	87.3	87.0	86.6	86.2
85	81.9	83.4	84.6	85.5	86.1	86.6	86.9	87.2	87.4	87.5	87.5	87.5	87.5	87.4	87.3	87.1	87.0	86.8	86.5	86.2
90	82.1	83.0	83.8	84.5	85.0	85.4	85.7	86.0	86.2	86.4	86.5	86.6	86.7	86.7	86.7	86.7	86.6	86.5	86.4	86.2
95	83.0	83.5	83.9	84.2	84.5	84.8	85.0	85.2	85.4	85.6	85.7	85.8	85.9	86.0	86.1	86.2	86.2	86.2	86.3	86.2
98	84.8	84.9	85.0	85.1	85.3	85.4	85.5	85.6	85.6	85.7	85.8	85.9	85.9	86.0	86.0	86.1	86.1	86.2	86.2	86.2

**Mean Annual Mass Removal Efficiencies for 2.50-inches of Retention for Zone 3**

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	94.3	96.4	97.2	97.5	97.6	97.6	97.3	96.8	96.1	95.4	94.7	94.1	93.4	92.7	92.0	91.3	90.5	89.7	88.9	88.1
35	93.3	95.6	96.5	96.9	97.1	97.1	96.8	96.3	95.7	95.1	94.5	93.9	93.2	92.6	91.9	91.2	90.4	89.7	88.9	88.1
40	92.3	94.7	95.8	96.3	96.5	96.5	96.3	95.8	95.3	94.7	94.2	93.6	93.0	92.4	91.7	91.1	90.3	89.6	88.9	88.1
45	91.2	93.9	95.0	95.6	95.9	95.9	95.6	95.2	94.8	94.3	93.8	93.3	92.8	92.2	91.6	90.9	90.2	89.5	88.8	88.1
50	90.3	93.0	94.2	94.9	95.1	95.1	94.9	94.6	94.3	93.8	93.4	93.0	92.5	92.0	91.4	90.8	90.1	89.5	88.8	88.1
55	89.3	92.1	93.4	94.0	94.2	94.2	94.1	93.9	93.7	93.3	93.0	92.6	92.2	91.7	91.2	90.6	90.0	89.4	88.8	88.1
60	88.4	91.0	92.2	92.9	93.1	93.3	93.3	93.2	93.0	92.8	92.5	92.2	91.8	91.4	90.9	90.4	89.9	89.3	88.7	88.1
65	87.2	89.6	90.9	91.6	92.1	92.3	92.4	92.4	92.3	92.2	92.0	91.7	91.4	91.0	90.7	90.2	89.7	89.2	88.7	88.1
70	85.8	88.2	89.5	90.5	91.0	91.3	91.5	91.6	91.6	91.5	91.4	91.2	90.9	90.6	90.3	89.9	89.5	89.0	88.6	88.1
75	84.7	87.0	88.3	89.2	89.9	90.3	90.6	90.7	90.8	90.8	90.7	90.6	90.4	90.2	89.9	89.6	89.2	88.9	88.5	88.1
80	84.0	85.9	87.2	88.1	88.8	89.2	89.6	89.8	89.9	90.0	90.0	89.9	89.8	89.7	89.5	89.2	89.0	88.7	88.4	88.1
85	83.8	85.3	86.3	87.1	87.7	88.2	88.5	88.8	89.0	89.1	89.1	89.1	89.1	89.1	89.0	88.8	88.7	88.5	88.3	88.1
90	84.1	85.0	85.8	86.4	86.8	87.2	87.5	87.8	88.0	88.1	88.3	88.3	88.4	88.4	88.4	88.4	88.3	88.3	88.2	88.1
95	85.1	85.5	85.9	86.2	86.5	86.7	86.9	87.1	87.3	87.4	87.5	87.7	87.8	87.8	87.9	88.0	88.0	88.1	88.1	88.1
98	86.7	86.8	86.9	87.0	87.1	87.2	87.3	87.4	87.5	87.6	87.6	87.7	87.8	87.8	87.9	87.9	88.0	88.0	88.1	88.1

### Mean Annual Mass Removal Efficiencies for 2.75-inches of Retention for Zone 3

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	94.6	96.5	97.3	97.7	97.8	97.9	97.7	97.4	96.8	96.2	95.6	94.9	94.4	93.7	93.1	92.4	91.8	91.1	90.4	89.6
35	93.6	95.9	96.7	97.1	97.3	97.4	97.3	97.0	96.5	95.9	95.3	94.7	94.2	93.6	93.0	92.4	91.7	91.0	90.3	89.6
40	92.8	95.1	96.1	96.6	96.8	97.0	96.8	96.5	96.0	95.5	95.0	94.5	94.0	93.4	92.8	92.2	91.6	91.0	90.3	89.6
45	91.8	94.3	95.4	96.0	96.3	96.4	96.3	96.0	95.6	95.1	94.7	94.2	93.7	93.2	92.7	92.1	91.6	90.9	90.3	89.6
50	91.0	93.6	94.8	95.4	95.7	95.8	95.6	95.4	95.0	94.7	94.3	93.9	93.5	93.0	92.5	92.0	91.5	90.9	90.3	89.6
55	90.2	92.8	94.0	94.7	95.0	95.0	94.9	94.7	94.5	94.2	93.9	93.5	93.2	92.8	92.3	91.8	91.3	90.8	90.2	89.6
60	89.4	92.0	93.2	93.8	94.0	94.1	94.2	94.0	93.9	93.7	93.4	93.1	92.9	92.5	92.1	91.7	91.2	90.7	90.2	89.6
65	88.7	90.9	92.0	92.7	93.1	93.3	93.3	93.3	93.2	93.1	92.9	92.7	92.5	92.2	91.8	91.4	91.1	90.6	90.1	89.6
70	87.5	89.6	90.8	91.6	92.1	92.3	92.5	92.5	92.5	92.5	92.4	92.2	92.0	91.8	91.5	91.2	90.9	90.5	90.1	89.6
75	86.4	88.4	89.7	90.4	91.0	91.3	91.6	91.7	91.8	91.8	91.8	91.7	91.6	91.4	91.2	90.9	90.7	90.3	90.0	89.6
80	85.8	87.4	88.6	89.4	90.0	90.4	90.7	90.9	91.0	91.1	91.1	91.1	91.0	90.9	90.8	90.6	90.4	90.2	89.9	89.6
85	85.5	86.8	87.7	88.5	89.0	89.4	89.8	90.0	90.2	90.3	90.4	90.4	90.4	90.4	90.4	90.3	90.1	90.0	89.8	89.6
90	85.8	86.6	87.3	87.9	88.3	88.7	89.0	89.2	89.4	89.6	89.7	89.8	89.8	89.9	89.9	89.9	89.8	89.8	89.7	89.6
95	86.9	87.2	87.6	87.8	88.1	88.3	88.5	88.7	88.9	89.0	89.1	89.2	89.3	89.4	89.5	89.5	89.5	89.6	89.6	89.6
98	88.4	88.5	88.6	88.7	88.8	88.9	88.9	89.0	89.1	89.1	89.2	89.3	89.3	89.4	89.4	89.5	89.5	89.6	89.6	89.6

### Mean Annual Mass Removal Efficiencies for 3.00-inches of Retention for Zone 3

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	94.9	96.7	97.4	97.8	98.0	98.0	98.0	97.8	97.4	96.9	96.3	95.7	95.1	94.6	94.0	93.4	92.8	92.2	91.6	90.9
35	93.9	96.0	96.9	97.3	97.5	97.6	97.7	97.4	97.1	96.6	96.0	95.5	94.9	94.4	93.9	93.3	92.7	92.2	91.6	90.9
40	93.1	95.4	96.3	96.8	97.1	97.2	97.2	97.1	96.7	96.2	95.7	95.2	94.7	94.3	93.7	93.2	92.7	92.1	91.5	90.9
45	92.4	94.7	95.7	96.3	96.6	96.8	96.8	96.6	96.2	95.8	95.4	95.0	94.5	94.1	93.6	93.1	92.6	92.1	91.5	90.9
50	91.6	94.0	95.2	95.8	96.1	96.3	96.2	96.0	95.8	95.4	95.1	94.7	94.3	93.9	93.4	93.0	92.5	92.0	91.5	90.9
55	91.0	93.4	94.6	95.2	95.6	95.7	95.6	95.4	95.2	94.9	94.6	94.3	94.0	93.6	93.3	92.8	92.4	91.9	91.4	90.9
60	90.4	92.7	93.9	94.6	94.8	94.9	94.9	94.8	94.6	94.4	94.2	93.9	93.7	93.4	93.0	92.7	92.3	91.9	91.4	90.9
65	89.8	92.0	93.0	93.6	93.9	94.1	94.2	94.1	94.0	93.9	93.7	93.5	93.3	93.1	92.8	92.5	92.1	91.8	91.4	90.9
70	89.0	90.9	91.9	92.6	93.0	93.2	93.3	93.4	93.4	93.3	93.2	93.1	92.9	92.8	92.5	92.2	92.0	91.6	91.3	90.9
75	88.0	89.7	90.8	91.6	92.0	92.3	92.5	92.6	92.7	92.7	92.7	92.6	92.5	92.4	92.2	92.0	91.8	91.5	91.2	90.9
80	87.3	88.8	89.8	90.5	91.0	91.4	91.7	91.8	92.0	92.0	92.1	92.1	92.1	92.0	91.8	91.7	91.6	91.4	91.2	90.9
85	87.0	88.1	89.0	89.7	90.1	90.5	90.8	91.1	91.3	91.4	91.5	91.5	91.5	91.5	91.5	91.4	91.3	91.2	91.1	90.9
90	87.2	88.0	88.6	89.1	89.5	89.9	90.2	90.4	90.6	90.7	90.8	90.9	91.0	91.0	91.1	91.1	91.1	91.0	91.0	90.9
95	88.3	88.7	88.9	89.2	89.4	89.6	89.8	90.0	90.1	90.2	90.4	90.5	90.6	90.7	90.7	90.8	90.8	90.9	90.9	90.9
98	89.7	89.8	89.9	90.0	90.1	90.2	90.3	90.3	90.4	90.5	90.5	90.6	90.6	90.7	90.7	90.8	90.8	90.9	90.9	90.9

### Mean Annual Mass Removal Efficiencies for 3.25-inches of Retention for Zone 3

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	95.2	96.9	97.5	97.9	98.1	98.2	98.2	98.1	97.8	97.5	96.9	96.4	95.8	95.3	94.7	94.2	93.7	93.1	92.6	92.0
35	94.1	96.2	97.0	97.5	97.7	97.8	97.9	97.8	97.5	97.2	96.7	96.2	95.6	95.1	94.6	94.1	93.6	93.1	92.5	92.0
40	93.4	95.6	96.6	97.0	97.3	97.5	97.5	97.4	97.2	96.8	96.4	95.9	95.4	95.0	94.5	94.0	93.5	93.0	92.5	92.0
45	92.8	95.0	96.0	96.6	96.9	97.1	97.1	97.1	96.8	96.5	96.1	95.7	95.2	94.8	94.4	93.9	93.5	93.0	92.5	92.0
50	92.1	94.4	95.5	96.1	96.5	96.7	96.7	96.6	96.3	96.1	95.7	95.4	95.0	94.6	94.2	93.8	93.4	92.9	92.5	92.0
55	91.5	93.8	95.0	95.6	96.0	96.2	96.2	96.0	95.9	95.6	95.3	95.0	94.7	94.4	94.0	93.7	93.3	92.9	92.4	92.0
60	91.1	93.3	94.4	95.1	95.5	95.6	95.5	95.5	95.3	95.1	94.9	94.7	94.4	94.1	93.8	93.5	93.2	92.8	92.4	92.0
65	90.7	92.7	93.8	94.4	94.7	94.8	94.9	94.9	94.8	94.6	94.5	94.3	94.0	93.8	93.6	93.3	93.0	92.7	92.4	92.0
70	90.3	92.0	92.9	93.4	93.8	94.0	94.2	94.2	94.1	94.1	94.0	93.8	93.7	93.5	93.4	93.1	92.9	92.6	92.3	92.0
75	89.4	90.9	91.8	92.5	93.0	93.2	93.4	93.5	93.5	93.5	93.4	93.4	93.3	93.2	93.1	92.9	92.7	92.5	92.2	92.0
80	88.7	90.1	91.0	91.6	92.0	92.3	92.6	92.7	92.8	92.9	92.9	92.9	92.9	92.9	92.8	92.6	92.5	92.3	92.2	92.0
85	88.4	89.4	90.2	90.7	91.2	91.5	91.8	92.0	92.1	92.3	92.4	92.4	92.5	92.5	92.4	92.4	92.3	92.2	92.1	92.0
90	88.5	89.2	89.7	90.2	90.6	90.9	91.2	91.4	91.6	91.7	91.9	91.9	92.0	92.0	92.0	92.1	92.1	92.1	92.0	92.0
95	89.6	89.9	90.1	90.4	90.6	90.8	90.9	91.1	91.2	91.3	91.4	91.5	91.6	91.7	91.8	91.8	91.9	91.9	92.0	92.0
98	90.8	90.9	91.0	91.1	91.2	91.2	91.3	91.4	91.4	91.5	91.6	91.6	91.7	91.7	91.8	91.8	91.9	91.9	92.0	92.0

### Mean Annual Mass Removal Efficiencies for 3.50-inches of Retention for Zone 3

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	95.5	97.0	97.6	98.0	98.2	98.3	98.3	98.3	98.1	97.9	97.5	96.9	96.4	95.9	95.4	94.9	94.4	93.9	93.4	92.9
35	94.4	96.3	97.2	97.6	97.9	98.0	98.0	98.0	97.9	97.6	97.2	96.7	96.3	95.8	95.3	94.8	94.4	93.9	93.4	92.9
40	93.6	95.8	96.8	97.2	97.5	97.6	97.7	97.7	97.6	97.3	96.9	96.5	96.1	95.6	95.2	94.7	94.3	93.8	93.4	92.9
45	93.2	95.3	96.3	96.8	97.1	97.3	97.4	97.4	97.3	97.0	96.6	96.3	95.9	95.4	95.0	94.6	94.2	93.8	93.3	92.9
50	92.6	94.7	95.8	96.4	96.7	97.0	97.1	97.0	96.9	96.6	96.3	96.0	95.6	95.2	94.9	94.5	94.1	93.7	93.3	92.9
55	92.1	94.2	95.3	96.0	96.4	96.6	96.7	96.6	96.4	96.2	95.9	95.6	95.3	95.0	94.7	94.4	94.0	93.7	93.3	92.9
60	91.7	93.8	94.9	95.5	95.9	96.1	96.1	96.0	95.9	95.8	95.5	95.3	95.0	94.8	94.5	94.2	93.9	93.6	93.2	92.9
65	91.4	93.3	94.4	95.0	95.4	95.5	95.5	95.5	95.4	95.3	95.1	94.9	94.7	94.5	94.3	94.0	93.8	93.5	93.2	92.9
70	91.2	92.9	93.8	94.3	94.5	94.7	94.8	94.9	94.8	94.8	94.7	94.5	94.4	94.2	94.0	93.9	93.7	93.4	93.1	92.9
75	90.7	92.0	92.8	93.3	93.7	94.0	94.1	94.2	94.2	94.2	94.2	94.1	94.0	93.9	93.8	93.7	93.5	93.3	93.1	92.9
80	89.9	91.1	91.9	92.5	92.9	93.2	93.4	93.5	93.6	93.6	93.7	93.6	93.6	93.6	93.5	93.4	93.3	93.2	93.0	92.9
85	89.7	90.5	91.2	91.7	92.1	92.4	92.7	92.8	93.0	93.0	93.1	93.2	93.2	93.2	93.2	93.2	93.1	93.1	93.0	92.9
90	89.7	90.3	90.8	91.2	91.5	91.8	92.0	92.2	92.4	92.5	92.7	92.8	92.8	92.9	92.9	92.9	92.9	92.9	92.9	92.9
95	90.6	90.9	91.1	91.3	91.5	91.7	91.9	92.0	92.2	92.3	92.4	92.4	92.4	92.5	92.6	92.7	92.7	92.8	92.8	92.9
98	91.8	91.9	92.0	92.0	92.1	92.2	92.2	92.3	92.4	92.4	92.5	92.5	92.6	92.6	92.7	92.7	92.8	92.8	92.8	92.9

### Mean Annual Mass Removal Efficiencies for 3.75-inches of Retention for Zone 3

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	95.8	97.2	97.8	98.1	98.2	98.4	98.4	98.4	98.3	98.2	97.9	97.5	97.0	96.5	96.0	95.5	95.0	94.6	94.1	93.6
35	94.7	96.5	97.3	97.7	98.0	98.1	98.2	98.2	98.1	97.9	97.7	97.3	96.8	96.3	95.9	95.4	95.0	94.5	94.1	93.6
40	93.9	95.9	96.9	97.4	97.7	97.8	97.9	97.9	97.9	97.7	97.4	97.0	96.6	96.2	95.8	95.3	94.9	94.5	94.1	93.6
45	93.4	95.5	96.5	97.0	97.3	97.5	97.6	97.7	97.6	97.4	97.1	96.8	96.4	96.0	95.6	95.2	94.8	94.5	94.1	93.6
50	93.1	95.1	96.0	96.6	97.0	97.2	97.3	97.4	97.3	97.1	96.8	96.5	96.2	95.8	95.5	95.1	94.8	94.4	94.0	93.6
55	92.5	94.6	95.6	96.2	96.6	96.9	97.0	97.0	96.9	96.7	96.5	96.2	95.9	95.6	95.3	95.0	94.7	94.3	94.0	93.6
60	92.2	94.1	95.2	95.9	96.3	96.5	96.6	96.6	96.4	96.3	96.1	95.9	95.6	95.4	95.1	94.8	94.6	94.3	94.0	93.6
65	92.0	93.8	94.8	95.5	95.9	96.1	96.1	96.0	96.0	95.9	95.7	95.5	95.3	95.1	94.9	94.7	94.4	94.2	93.9	93.6
70	91.9	93.5	94.4	95.0	95.3	95.4	95.4	95.5	95.5	95.4	95.3	95.2	95.0	94.8	94.7	94.5	94.3	94.1	93.9	93.6
75	91.8	93.0	93.7	94.1	94.4	94.7	94.8	94.9	94.9	94.9	94.8	94.7	94.7	94.5	94.4	94.3	94.2	94.0	93.8	93.6
80	91.1	92.1	92.8	93.3	93.7	94.0	94.1	94.2	94.3	94.3	94.3	94.3	94.3	94.2	94.2	94.1	94.0	93.9	93.8	93.6
85	90.7	91.6	92.2	92.6	93.0	93.2	93.4	93.6	93.7	93.8	93.8	93.9	93.9	93.9	93.9	93.9	93.8	93.8	93.7	93.6
90	90.8	91.3	91.8	92.1	92.4	92.7	92.9	93.0	93.2	93.3	93.4	93.5	93.5	93.6	93.6	93.7	93.7	93.7	93.7	93.6
95	91.5	91.7	92.0	92.2	92.3	92.5	92.7	92.8	92.9	93.0	93.1	93.2	93.3	93.4	93.4	93.5	93.5	93.6	93.6	93.6
98	92.6	92.7	92.8	92.9	92.9	93.0	93.1	93.1	93.2	93.2	93.3	93.3	93.4	93.4	93.4	93.5	93.5	93.6	93.6	93.6

### Mean Annual Mass Removal Efficiencies for 4.00-inches of Retention for Zone 3

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	96.1	97.4	97.9	98.1	98.3	98.4	98.5	98.5	98.5	98.4	98.2	97.9	97.4	97.0	96.5	96.1	95.6	95.2	94.7	94.3
35	95.0	96.7	97.4	97.8	98.0	98.2	98.3	98.3	98.3	98.2	98.0	97.7	97.3	96.9	96.4	96.0	95.5	95.1	94.7	94.3
40	94.1	96.1	97.0	97.5	97.8	97.9	98.0	98.1	98.1	98.0	97.8	97.5	97.1	96.7	96.3	95.9	95.5	95.1	94.7	94.3
45	93.6	95.7	96.7	97.2	97.5	97.7	97.8	97.8	97.8	97.7	97.5	97.3	96.9	96.5	96.2	95.8	95.4	95.0	94.7	94.3
50	93.3	95.4	96.3	96.8	97.1	97.4	97.5	97.6	97.6	97.5	97.3	97.0	96.7	96.4	96.0	95.7	95.3	95.0	94.6	94.3
55	93.0	94.9	95.9	96.4	96.8	97.1	97.3	97.3	97.3	97.1	96.9	96.7	96.4	96.1	95.9	95.5	95.2	94.9	94.6	94.3
60	92.7	94.5	95.5	96.1	96.5	96.8	97.0	97.0	96.9	96.8	96.6	96.4	96.2	95.9	95.7	95.4	95.1	94.9	94.6	94.3
65	92.4	94.2	95.2	95.8	96.2	96.5	96.6	96.6	96.5	96.4	96.2	96.1	95.9	95.7	95.5	95.2	95.0	94.8	94.6	94.3
70	92.5	94.0	94.9	95.5	95.8	96.0	96.0	96.0	96.0	95.9	95.8	95.7	95.6	95.4	95.2	95.1	94.9	94.7	94.5	94.3
75	92.5	93.7	94.5	94.9	95.1	95.3	95.4	95.5	95.5	95.5	95.4	95.3	95.3	95.1	95.0	94.9	94.8	94.6	94.5	94.3
80	92.2	93.1	93.7	94.1	94.4	94.6	94.8	94.9	94.9	95.0	95.0	94.9	94.9	94.8	94.8	94.7	94.6	94.5	94.4	94.3
85	91.7	92.5	93.0	93.4	93.7	94.0	94.1	94.3	94.4	94.5	94.5	94.5	94.5	94.5	94.5	94.5	94.5	94.4	94.4	94.3
90	91.7	92.2	92.6	92.9	93.2	93.4	93.6	93.7	93.9	94.0	94.0	94.1	94.2	94.2	94.3	94.3	94.3	94.3	94.3	94.3
95	92.4	92.6	92.8	92.9	93.1	93.2	93.4	93.5	93.6	93.7	93.8	93.9	93.9	94.0	94.1	94.1	94.2	94.2	94.3	94.3
98	93.3	93.4	93.5	93.6	93.6	93.7	93.7	93.8	93.8	93.9	93.9	94.0	94.0	94.1	94.1	94.2	94.2	94.2	94.3	94.3



### Mean Annual Mass Removal Efficiencies for 0.25-inches of Retention for Zone 4

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	90.1	86.6	79.2	71.4	64.5	58.6	53.5	49.2	45.5	42.3	39.5	37.1	34.9	33.0	31.3	29.7	28.3	27.1	25.9	24.8
35	86.2	84.3	77.8	70.5	63.9	58.2	53.2	49.0	45.3	42.2	39.4	37.0	34.9	33.0	31.2	29.7	28.3	27.0	25.9	24.8
40	81.6	81.5	75.9	69.3	63.1	57.6	52.8	48.7	45.1	42.0	39.3	36.9	34.8	32.9	31.2	29.7	28.3	27.0	25.9	24.8
45	76.5	78.1	73.7	67.8	62.0	56.8	52.2	48.2	44.8	41.8	39.1	36.8	34.7	32.8	31.1	29.6	28.3	27.0	25.9	24.8
50	71.0	74.2	71.0	65.9	60.7	55.8	51.5	47.7	44.4	41.4	38.9	36.6	34.5	32.7	31.1	29.6	28.2	27.0	25.9	24.8
55	65.3	69.9	67.9	63.7	59.1	54.7	50.6	47.0	43.8	41.1	38.5	36.3	34.4	32.6	31.0	29.5	28.2	27.0	25.8	24.8
60	59.7	65.2	64.4	61.2	57.2	53.2	49.6	46.2	43.2	40.6	38.2	36.1	34.1	32.4	30.8	29.4	28.1	26.9	25.8	24.8
65	54.2	60.2	60.5	58.2	55.0	51.5	48.2	45.2	42.4	39.9	37.7	35.7	33.8	32.2	30.7	29.3	28.0	26.9	25.8	24.8
70	49.1	54.9	56.1	54.7	52.3	49.4	46.6	43.9	41.4	39.2	37.1	35.2	33.5	31.9	30.5	29.1	27.9	26.8	25.8	24.8
75	44.3	49.4	51.1	50.7	49.1	46.9	44.6	42.3	40.1	38.1	36.3	34.6	33.0	31.5	30.2	28.9	27.8	26.7	25.7	24.8
80	40.0	44.1	45.8	46.0	45.2	43.7	42.0	40.2	38.5	36.8	35.2	33.7	32.3	31.0	29.8	28.7	27.6	26.6	25.7	24.8
85	36.2	38.9	40.4	40.8	40.6	39.8	38.8	37.5	36.3	35.0	33.7	32.5	31.4	30.2	29.2	28.2	27.3	26.4	25.6	24.8
90	32.8	34.2	35.0	35.4	35.4	35.1	34.6	33.9	33.2	32.4	31.6	30.8	29.9	29.1	28.3	27.6	26.9	26.1	25.5	24.8
95	29.3	29.7	29.9	30.0	29.9	29.8	29.7	29.4	29.1	28.8	28.5	28.1	27.7	27.3	26.9	26.5	26.1	25.6	25.2	24.8
98	27.2	27.2	27.2	27.1	27.0	27.0	26.8	26.7	26.6	26.5	26.3	26.2	26.0	25.9	25.7	25.5	25.4	25.2	25.0	24.8

### Mean Annual Mass Removal Efficiencies for 0.50-inches of Retention for Zone 4

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	94.0	94.2	92.1	88.8	84.8	80.5	76.3	72.4	68.6	65.2	62.0	59.1	56.4	53.9	51.7	49.5	47.6	45.8	44.1	42.6
35	91.1	92.3	90.7	87.7	84.0	79.9	75.9	72.0	68.4	65.0	61.9	59.0	56.3	53.9	51.6	49.5	47.6	45.8	44.1	42.6
40	87.8	90.0	88.9	86.4	82.9	79.1	75.3	71.5	68.0	64.7	61.6	58.8	56.2	53.8	51.5	49.4	47.5	45.7	44.1	42.6
45	84.0	87.2	86.8	84.7	81.6	78.1	74.5	70.9	67.5	64.3	61.3	58.6	56.0	53.6	51.4	49.4	47.5	45.7	44.1	42.6
50	79.9	84.0	84.3	82.7	80.1	76.9	73.5	70.2	66.9	63.9	61.0	58.3	55.8	53.5	51.3	49.3	47.4	45.7	44.1	42.6
55	75.6	80.4	81.4	80.4	78.2	75.4	72.3	69.2	66.2	63.3	60.5	57.9	55.5	53.2	51.1	49.2	47.3	45.6	44.0	42.6
60	71.3	76.5	78.1	77.6	75.9	73.6	70.9	68.0	65.2	62.5	59.9	57.4	55.1	53.0	50.9	49.0	47.2	45.6	44.0	42.6
65	67.1	72.4	74.4	74.5	73.3	71.4	69.1	66.6	64.1	61.6	59.2	56.9	54.7	52.6	50.6	48.8	47.1	45.5	44.0	42.6
70	63.0	68.1	70.3	70.8	70.2	68.9	67.0	64.9	62.7	60.5	58.3	56.1	54.1	52.1	50.3	48.6	46.9	45.4	43.9	42.6
75	59.2	63.7	65.9	66.7	66.6	65.7	64.4	62.7	60.9	59.0	57.1	55.2	53.3	51.5	49.8	48.2	46.7	45.2	43.8	42.6
80	55.8	59.4	61.4	62.3	62.4	61.9	61.1	59.9	58.6	57.1	55.5	53.9	52.3	50.7	49.2	47.8	46.4	45.0	43.8	42.6
85	52.7	55.2	56.7	57.5	57.7	57.6	57.1	56.4	55.5	54.5	53.3	52.1	50.8	49.6	48.3	47.1	45.9	44.7	43.6	42.6
90	49.7	51.1	52.0	52.5	52.8	52.8	52.6	52.2	51.7	51.1	50.3	49.6	48.7	47.9	47.0	46.1	45.2	44.3	43.4	42.6
95	46.7	47.1	47.4	47.5	47.6	47.6	47.5	47.3	47.1	46.8	46.5	46.2	45.8	45.4	44.9	44.5	44.0	43.5	43.0	42.6
98	44.9	44.9	44.8	44.8	44.7	44.7	44.6	44.5	44.3	44.2	44.1	44.0	43.8	43.6	43.5	43.3	43.1	42.9	42.7	42.6

**Mean Annual Mass Removal Efficiencies for 0.75-inches of Retention for Zone 4**

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	95.6	96.4	95.6	94.1	92.1	89.6	86.8	83.9	81.0	78.1	75.3	72.7	70.1	67.7	65.4	63.3	61.2	59.3	57.4	55.7
35	93.5	94.9	94.5	93.2	91.3	89.0	86.3	83.5	80.7	77.9	75.1	72.5	70.0	67.6	65.4	63.2	61.2	59.3	57.4	55.7
40	91.0	93.1	93.0	92.0	90.3	88.1	85.7	83.0	80.2	77.5	74.9	72.3	69.8	67.5	65.3	63.1	61.1	59.2	57.4	55.7
45	88.1	90.9	91.3	90.5	89.1	87.1	84.8	82.3	79.7	77.1	74.5	72.0	69.6	67.3	65.1	63.0	61.1	59.2	57.4	55.7
50	85.0	88.4	89.2	88.8	87.6	85.9	83.8	81.5	79.0	76.5	74.1	71.7	69.3	67.1	65.0	62.9	61.0	59.1	57.4	55.7
55	81.7	85.7	86.8	86.8	85.9	84.5	82.6	80.5	78.2	75.9	73.5	71.2	69.0	66.8	64.8	62.8	60.9	59.1	57.4	55.7
60	78.4	82.6	84.1	84.4	83.9	82.7	81.1	79.2	77.2	75.0	72.8	70.7	68.6	66.5	64.5	62.6	60.8	59.0	57.3	55.7
65	75.0	79.3	81.1	81.7	81.5	80.7	79.4	77.8	76.0	74.0	72.0	70.0	68.0	66.1	64.2	62.3	60.6	58.9	57.3	55.7
70	71.7	75.9	77.9	78.7	78.7	78.2	77.3	76.0	74.4	72.7	71.0	69.1	67.3	65.5	63.8	62.0	60.4	58.8	57.2	55.7
75	68.7	72.5	74.4	75.4	75.6	75.3	74.7	73.7	72.5	71.1	69.6	68.0	66.4	64.8	63.2	61.6	60.1	58.6	57.1	55.7
80	65.9	69.0	70.8	71.7	72.1	72.1	71.7	71.0	70.1	69.0	67.8	66.6	65.2	63.9	62.5	61.1	59.7	58.3	57.0	55.7
85	63.5	65.7	67.1	67.9	68.3	68.3	68.1	67.7	67.1	66.4	65.5	64.6	63.6	62.5	61.4	60.3	59.1	58.0	56.8	55.7
90	61.2	62.4	63.2	63.8	64.1	64.2	64.1	63.9	63.6	63.2	62.7	62.1	61.4	60.7	59.9	59.1	58.3	57.4	56.6	55.7
95	58.7	59.1	59.4	59.6	59.7	59.7	59.7	59.7	59.5	59.4	59.1	58.9	58.6	58.2	57.9	57.5	57.1	56.6	56.2	55.7
98	57.5	57.5	57.5	57.5	57.5	57.4	57.4	57.3	57.2	57.1	57.0	56.9	56.8	56.6	56.5	56.4	56.2	56.0	55.9	55.7

**Mean Annual Mass Removal Efficiencies for 1.00-inches of Retention for Zone 4**

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	96.6	97.5	97.2	96.4	95.2	93.7	91.9	90.0	87.9	85.7	83.5	81.2	79.0	76.9	74.8	72.8	70.9	69.1	67.3	65.6
35	95.0	96.3	96.2	95.6	94.5	93.1	91.4	89.6	87.5	85.4	83.2	81.1	78.9	76.8	74.8	72.8	70.9	69.0	67.2	65.6
40	93.0	94.9	95.1	94.6	93.6	92.4	90.8	89.0	87.1	85.1	82.9	80.8	78.7	76.7	74.7	72.7	70.8	69.0	67.2	65.6
45	90.8	93.1	93.6	93.4	92.6	91.5	90.0	88.4	86.5	84.6	82.6	80.5	78.5	76.5	74.5	72.6	70.7	68.9	67.2	65.6
50	88.3	91.1	92.0	91.9	91.4	90.4	89.1	87.6	85.9	84.0	82.1	80.1	78.2	76.2	74.3	72.5	70.6	68.9	67.2	65.6
55	85.7	89.0	90.1	90.2	89.9	89.1	88.0	86.6	85.1	83.4	81.5	79.7	77.8	75.9	74.1	72.3	70.5	68.8	67.1	65.6
60	83.1	86.6	87.9	88.3	88.1	87.6	86.7	85.5	84.1	82.5	80.8	79.1	77.3	75.6	73.8	72.1	70.4	68.7	67.1	65.6
65	80.4	83.9	85.5	86.1	86.1	85.8	85.1	84.1	82.9	81.5	80.0	78.4	76.8	75.1	73.5	71.8	70.2	68.6	67.1	65.6
70	77.7	81.2	82.8	83.6	83.9	83.7	83.2	82.4	81.4	80.3	78.9	77.5	76.0	74.5	73.0	71.5	70.0	68.5	67.0	65.6
75	75.2	78.4	80.1	81.0	81.3	81.3	81.0	80.4	79.6	78.7	77.6	76.4	75.1	73.8	72.4	71.0	69.6	68.3	66.9	65.6
80	73.0	75.6	77.2	78.1	78.5	78.6	78.4	78.1	77.5	76.8	75.9	74.9	73.9	72.8	71.6	70.4	69.2	68.0	66.8	65.6
85	71.1	73.0	74.2	75.0	75.4	75.6	75.5	75.3	74.9	74.4	73.8	73.1	72.3	71.4	70.5	69.6	68.6	67.6	66.6	65.6
90	69.4	70.5	71.2	71.7	72.0	72.2	72.2	72.1	71.9	71.6	71.2	70.8	70.3	69.7	69.1	68.5	67.8	67.1	66.3	65.6
95	67.6	67.9	68.1	68.3	68.4	68.5	68.5	68.5	68.4	68.3	68.2	68.0	67.8	67.6	67.3	67.0	66.7	66.3	65.9	65.6
98	66.7	66.8	66.8	66.8	66.8	66.7	66.7	66.7	66.6	66.6	66.5	66.4	66.3	66.3	66.1	66.0	65.9	65.8	65.7	65.6

**Mean Annual Mass Removal Efficiencies for 1.25-inches of Retention for Zone 4**

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	97.3	98.0	98.0	97.5	96.8	95.8	94.6	93.3	91.8	90.2	88.5	86.8	85.0	83.2	81.4	79.6	77.9	76.2	74.5	72.9
35	95.9	97.2	97.3	96.9	96.2	95.3	94.2	92.9	91.5	89.9	88.3	86.6	84.8	83.0	81.3	79.5	77.8	76.2	74.5	72.9
40	94.5	96.0	96.3	96.1	95.5	94.6	93.6	92.4	91.1	89.6	88.0	86.3	84.6	82.9	81.2	79.5	77.8	76.1	74.5	72.9
45	92.7	94.6	95.1	95.0	94.6	93.9	93.0	91.8	90.6	89.1	87.6	86.0	84.4	82.7	81.0	79.3	77.7	76.1	74.5	72.9
50	90.7	93.1	93.8	93.8	93.6	93.0	92.1	91.1	89.9	88.6	87.2	85.7	84.1	82.4	80.8	79.2	77.6	76.0	74.5	72.9
55	88.6	91.3	92.2	92.5	92.3	91.9	91.2	90.3	89.2	88.0	86.6	85.2	83.7	82.1	80.6	79.0	77.5	75.9	74.4	72.9
60	86.4	89.3	90.5	90.9	90.9	90.6	90.0	89.2	88.3	87.2	86.0	84.6	83.2	81.8	80.3	78.8	77.3	75.8	74.4	72.9
65	84.3	87.2	88.5	89.1	89.2	89.0	88.6	88.0	87.2	86.3	85.2	84.0	82.7	81.3	79.9	78.5	77.1	75.7	74.3	72.9
70	82.1	85.0	86.4	87.1	87.4	87.3	87.0	86.6	85.9	85.1	84.2	83.1	82.0	80.7	79.5	78.2	76.9	75.6	74.3	72.9
75	80.1	82.7	84.1	84.9	85.3	85.4	85.2	84.9	84.4	83.7	82.9	82.0	81.1	80.0	78.9	77.7	76.6	75.4	74.2	72.9
80	78.2	80.4	81.7	82.5	83.0	83.2	83.1	82.9	82.5	82.0	81.4	80.7	79.9	79.1	78.1	77.1	76.1	75.1	74.0	72.9
85	76.7	78.3	79.3	80.1	80.5	80.7	80.7	80.6	80.4	80.1	79.6	79.1	78.5	77.8	77.1	76.4	75.5	74.7	73.8	72.9
90	75.4	76.3	77.0	77.5	77.8	78.0	78.1	78.0	77.9	77.7	77.5	77.1	76.8	76.3	75.9	75.3	74.8	74.2	73.6	72.9
95	74.2	74.5	74.7	74.9	75.0	75.1	75.1	75.1	75.1	75.0	74.9	74.8	74.6	74.5	74.3	74.0	73.8	73.5	73.3	72.9
98	73.7	73.7	73.7	73.7	73.7	73.7	73.7	73.7	73.7	73.6	73.6	73.6	73.5	73.4	73.4	73.3	73.2	73.1	73.0	72.9

**Mean Annual Mass Removal Efficiencies for 1.50-inches of Retention for Zone 4**

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	97.8	98.4	98.5	98.2	97.7	97.1	96.2	95.3	94.2	93.0	91.7	90.4	89.0	87.5	86.0	84.5	83.0	81.5	80.0	78.5
35	96.7	97.7	97.9	97.7	97.3	96.6	95.8	94.9	93.9	92.8	91.5	90.2	88.8	87.4	85.9	84.4	82.9	81.4	80.0	78.5
40	95.5	96.8	97.1	97.0	96.6	96.1	95.4	94.5	93.5	92.4	91.2	89.9	88.6	87.2	85.8	84.3	82.9	81.4	80.0	78.5
45	94.1	95.7	96.2	96.2	95.9	95.4	94.8	94.0	93.1	92.0	90.9	89.7	88.4	87.0	85.6	84.2	82.8	81.3	79.9	78.5
50	92.5	94.4	95.1	95.2	95.0	94.6	94.1	93.3	92.5	91.5	90.5	89.3	88.1	86.8	85.4	84.1	82.7	81.3	79.9	78.5
55	90.8	93.0	93.8	94.0	94.0	93.7	93.2	92.6	91.8	91.0	90.0	88.9	87.7	86.5	85.2	83.9	82.5	81.2	79.9	78.5
60	88.9	91.3	92.3	92.7	92.8	92.6	92.2	91.7	91.0	90.3	89.4	88.4	87.3	86.1	84.9	83.7	82.4	81.1	79.8	78.5
65	87.1	89.6	90.7	91.3	91.4	91.3	91.1	90.6	90.1	89.4	88.6	87.7	86.8	85.7	84.6	83.4	82.2	81.0	79.8	78.5
70	85.4	87.8	89.0	89.6	89.9	89.9	89.7	89.4	89.0	88.4	87.7	87.0	86.1	85.1	84.1	83.1	82.0	80.8	79.7	78.5
75	83.8	85.9	87.1	87.8	88.2	88.3	88.2	88.0	87.7	87.2	86.7	86.0	85.3	84.4	83.6	82.6	81.6	80.6	79.6	78.5
80	82.2	84.0	85.2	85.9	86.3	86.4	86.5	86.4	86.2	85.8	85.4	84.9	84.3	83.6	82.9	82.1	81.2	80.4	79.5	78.5
85	81.0	82.3	83.2	83.8	84.2	84.4	84.5	84.5	84.4	84.2	83.9	83.5	83.0	82.5	82.0	81.4	80.7	80.0	79.3	78.5
90	80.0	80.7	81.3	81.8	82.1	82.3	82.4	82.4	82.4	82.2	82.1	81.8	81.6	81.2	80.9	80.5	80.0	79.6	79.1	78.5
95	79.1	79.4	79.6	79.8	79.9	80.0	80.1	80.1	80.1	80.1	80.0	79.9	79.8	79.7	79.6	79.4	79.2	79.0	78.8	78.5
98	79.0	79.0	79.0	79.1	79.1	79.1	79.1	79.1	79.0	79.0	79.0	79.0	78.9	78.9	78.8	78.8	78.7	78.7	78.6	78.5

**Mean Annual Mass Removal Efficiencies for 1.75-inches of Retention for Zone 4**

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	98.2	98.7	98.8	98.7	98.4	97.9	97.3	96.5	95.7	94.8	93.8	92.8	91.7	90.5	89.3	88.0	86.7	85.4	84.1	82.8
35	97.3	98.1	98.3	98.2	97.9	97.5	96.9	96.2	95.5	94.6	93.6	92.6	91.5	90.4	89.2	87.9	86.7	85.4	84.1	82.8
40	96.2	97.4	97.7	97.7	97.4	97.0	96.5	95.9	95.1	94.3	93.4	92.4	91.3	90.2	89.0	87.8	86.6	85.4	84.1	82.8
45	95.1	96.5	96.9	97.0	96.8	96.5	96.0	95.4	94.7	93.9	93.1	92.1	91.1	90.0	88.9	87.7	86.5	85.3	84.1	82.8
50	93.9	95.5	96.0	96.1	96.0	95.8	95.4	94.8	94.2	93.5	92.7	91.8	90.8	89.8	88.7	87.6	86.4	85.2	84.0	82.8
55	92.4	94.3	95.0	95.2	95.2	95.0	94.6	94.2	93.6	93.0	92.2	91.4	90.5	89.5	88.5	87.4	86.3	85.2	84.0	82.8
60	90.9	92.9	93.7	94.1	94.2	94.0	93.8	93.4	92.9	92.4	91.7	90.9	90.1	89.2	88.2	87.2	86.2	85.1	83.9	82.8
65	89.4	91.4	92.4	92.9	93.0	93.0	92.8	92.5	92.1	91.6	91.0	90.4	89.6	88.8	87.9	87.0	86.0	84.9	83.9	82.8
70	87.9	89.9	90.9	91.5	91.7	91.8	91.7	91.5	91.2	90.7	90.3	89.7	89.0	88.3	87.5	86.6	85.7	84.8	83.8	82.8
75	86.5	88.4	89.4	90.0	90.3	90.5	90.4	90.3	90.1	89.7	89.3	88.9	88.3	87.7	87.0	86.2	85.4	84.6	83.7	82.8
80	85.3	86.8	87.8	88.4	88.8	88.9	89.0	88.9	88.8	88.6	88.3	87.9	87.4	86.9	86.4	85.7	85.1	84.4	83.6	82.8
85	84.3	85.4	86.2	86.7	87.1	87.3	87.4	87.4	87.3	87.2	87.0	86.7	86.4	86.0	85.6	85.1	84.6	84.0	83.4	82.8
90	83.5	84.1	84.7	85.0	85.3	85.5	85.7	85.7	85.7	85.6	85.5	85.4	85.2	84.9	84.7	84.4	84.0	83.7	83.3	82.8
95	82.9	83.2	83.4	83.6	83.7	83.8	83.9	83.9	83.9	83.9	83.9	83.9	83.8	83.8	83.7	83.6	83.5	83.3	83.2	82.8
98	83.0	83.1	83.1	83.1	83.1	83.1	83.2	83.2	83.2	83.1	83.1	83.1	83.1	83.1	83.0	83.0	83.0	82.9	82.9	82.8

**Mean Annual Mass Removal Efficiencies for 2.00-inches of Retention for Zone 4**

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	98.5	99.0	99.1	99.0	98.7	98.4	98.0	97.4	96.8	96.1	95.3	94.5	93.6	92.6	91.6	90.6	89.5	88.4	87.3	86.1
35	97.8	98.5	98.6	98.6	98.4	98.1	97.7	97.1	96.5	95.9	95.1	94.3	93.4	92.5	91.5	90.5	89.4	88.4	87.3	86.1
40	96.9	97.8	98.1	98.1	98.0	97.7	97.3	96.8	96.2	95.6	94.9	94.1	93.3	92.4	91.4	90.4	89.4	88.3	87.2	86.1
45	95.9	97.1	97.5	97.6	97.5	97.2	96.8	96.4	95.9	95.3	94.6	93.8	93.0	92.2	91.3	90.3	89.3	88.3	87.2	86.1
50	94.9	96.3	96.7	96.9	96.8	96.6	96.3	95.9	95.4	94.9	94.2	93.6	92.8	92.0	91.1	90.2	89.2	88.2	87.2	86.1
55	93.7	95.3	95.9	96.1	96.1	95.9	95.7	95.3	94.9	94.4	93.8	93.2	92.5	91.7	90.9	90.0	89.1	88.1	87.1	86.1
60	92.5	94.1	94.9	95.1	95.2	95.1	95.0	94.7	94.3	93.9	93.4	92.8	92.1	91.4	90.6	89.8	88.9	88.0	87.1	86.1
65	91.2	92.9	93.7	94.1	94.3	94.3	94.1	93.9	93.6	93.2	92.8	92.3	91.7	91.0	90.3	89.6	88.8	87.9	87.1	86.1
70	89.9	91.6	92.5	92.9	93.2	93.2	93.2	93.0	92.8	92.5	92.1	91.7	91.2	90.6	90.0	89.3	88.6	87.8	87.0	86.1
75	88.7	90.2	91.2	91.7	92.0	92.1	92.1	92.0	91.9	91.6	91.3	91.0	90.5	90.1	89.5	88.9	88.3	87.6	86.9	86.1
80	87.7	89.0	89.8	90.3	90.7	90.9	90.9	90.9	90.8	90.6	90.4	90.1	89.8	89.4	89.0	88.5	88.0	87.4	86.8	86.1
85	86.9	87.8	88.5	89.0	89.3	89.5	89.6	89.6	89.6	89.5	89.4	89.2	88.9	88.7	88.3	88.0	87.6	87.1	86.6	86.1
90	86.3	86.8	87.3	87.6	87.9	88.0	88.2	88.2	88.3	88.2	88.2	88.1	87.9	87.8	87.6	87.3	87.1	86.8	86.5	86.1
95	85.9	86.1	86.3	86.5	86.6	86.7	86.8	86.8	86.8	86.9	86.9	86.8	86.8	86.8	86.7	86.6	86.5	86.4	86.3	86.1
98	86.1	86.2	86.2	86.2	86.3	86.3	86.3	86.3	86.3	86.3	86.3	86.3	86.3	86.3	86.3	86.2	86.2	86.2	86.2	86.1











**Mean Annual Mass Removal Efficiencies for 0.25-inches of Retention for Zone 5**

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	83.0	80.8	74.1	67.0	60.7	55.3	50.7	46.8	43.4	40.4	37.8	35.5	33.5	31.7	30.1	28.6	27.3	26.1	25.0	24.0
35	77.3	77.4	72.0	65.6	59.8	54.7	50.2	46.4	43.1	40.2	37.6	35.4	33.4	31.6	30.0	28.6	27.3	26.1	25.0	24.0
40	71.3	73.5	69.4	63.9	58.6	53.8	49.6	45.9	42.7	39.9	37.4	35.2	33.3	31.5	30.0	28.5	27.3	26.1	25.0	24.0
45	65.3	69.3	66.5	61.9	57.2	52.8	48.8	45.3	42.3	39.6	37.1	35.0	33.1	31.4	29.9	28.5	27.2	26.0	25.0	24.0
50	59.6	64.8	63.4	59.6	55.5	51.6	47.9	44.7	41.7	39.2	36.8	34.8	32.9	31.3	29.8	28.4	27.2	26.0	25.0	24.0
55	54.0	60.2	59.9	57.1	53.7	50.2	46.9	43.9	41.1	38.7	36.5	34.5	32.7	31.1	29.6	28.3	27.1	26.0	24.9	24.0
60	49.0	55.7	56.3	54.4	51.6	48.6	45.6	42.9	40.4	38.1	36.0	34.1	32.4	30.9	29.5	28.2	27.0	25.9	24.9	24.0
65	44.5	51.0	52.5	51.4	49.3	46.8	44.2	41.8	39.5	37.4	35.5	33.7	32.1	30.6	29.3	28.1	26.9	25.9	24.9	24.0
70	40.5	46.5	48.5	48.1	46.6	44.7	42.6	40.5	38.4	36.6	34.8	33.2	31.7	30.3	29.1	27.9	26.8	25.8	24.9	24.0
75	37.0	42.0	44.2	44.5	43.7	42.2	40.6	38.9	37.2	35.5	34.0	32.5	31.2	29.9	28.8	27.7	26.7	25.7	24.8	24.0
80	33.9	37.8	39.8	40.5	40.2	39.4	38.2	36.9	35.6	34.2	32.9	31.7	30.5	29.4	28.4	27.4	26.5	25.6	24.8	24.0
85	31.1	33.8	35.4	36.1	36.3	35.9	35.3	34.5	33.5	32.5	31.5	30.5	29.6	28.7	27.8	27.0	26.2	25.4	24.7	24.0
90	28.7	30.2	31.2	31.8	32.0	32.0	31.7	31.3	30.8	30.2	29.6	29.0	28.3	27.6	27.0	26.4	25.7	25.1	24.6	24.0
95	26.6	27.0	27.4	27.6	27.7	27.7	27.7	27.6	27.4	27.2	26.9	26.6	26.3	26.0	25.7	25.4	25.0	24.7	24.3	24.0
98	25.7	25.7	25.7	25.7	25.7	25.6	25.6	25.5	25.4	25.3	25.2	25.1	25.0	24.8	24.7	24.6	24.4	24.3	24.1	24.0

**Mean Annual Mass Removal Efficiencies for 0.50-inches of Retention for Zone 5**

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	88.6	89.9	87.9	84.5	80.5	76.4	72.3	68.5	65.1	61.9	58.9	56.2	53.7	51.4	49.3	47.3	45.5	43.8	42.2	40.8
35	84.1	86.8	85.6	82.8	79.3	75.4	71.6	68.0	64.6	61.5	58.7	56.0	53.6	51.3	49.2	47.3	45.5	43.8	42.2	40.8
40	79.3	83.3	82.9	80.8	77.8	74.3	70.7	67.3	64.1	61.1	58.3	55.8	53.4	51.1	49.1	47.2	45.4	43.8	42.2	40.8
45	74.4	79.5	80.0	78.5	76.0	72.9	69.6	66.5	63.4	60.6	57.9	55.4	53.1	51.0	48.9	47.1	45.3	43.7	42.2	40.8
50	69.7	75.5	76.8	76.0	73.9	71.3	68.4	65.5	62.6	60.0	57.4	55.0	52.8	50.7	48.8	47.0	45.3	43.7	42.2	40.8
55	65.2	71.4	73.4	73.1	71.7	69.5	66.9	64.3	61.7	59.2	56.9	54.6	52.5	50.4	48.6	46.8	45.2	43.6	42.1	40.8
60	61.0	67.2	69.7	70.1	69.2	67.4	65.3	63.0	60.6	58.4	56.2	54.0	52.0	50.1	48.3	46.6	45.0	43.5	42.1	40.8
65	57.1	63.1	65.9	66.8	66.4	65.1	63.3	61.4	59.4	57.3	55.3	53.4	51.5	49.7	48.0	46.4	44.9	43.4	42.1	40.8
70	53.6	59.2	62.0	63.2	63.3	62.5	61.2	59.6	57.9	56.1	54.3	52.6	50.9	49.2	47.6	46.1	44.7	43.3	42.0	40.8
75	50.7	55.5	58.1	59.5	59.8	59.4	58.6	57.4	56.1	54.6	53.1	51.6	50.1	48.6	47.1	45.8	44.4	43.2	41.9	40.8
80	48.3	52.0	54.3	55.5	56.0	56.0	55.6	54.8	53.9	52.8	51.6	50.3	49.0	47.8	46.5	45.3	44.1	43.0	41.8	40.8
85	46.2	48.7	50.5	51.5	52.0	52.2	52.1	51.7	51.1	50.4	49.6	48.6	47.6	46.7	45.6	44.6	43.7	42.7	41.7	40.8
90	44.2	45.6	46.7	47.4	47.9	48.1	48.2	48.1	47.8	47.4	46.9	46.4	45.7	45.1	44.4	43.7	43.0	42.2	41.5	40.8
95	42.5	43.0	43.4	43.7	43.9	44.0	44.1	44.1	44.0	43.9	43.7	43.5	43.2	43.0	42.7	42.3	42.0	41.6	41.2	40.8
98	42.1	42.2	42.2	42.2	42.2	42.2	42.2	42.1	42.1	42.0	41.9	41.8	41.7	41.6	41.5	41.4	41.2	41.1	40.9	40.8

**Mean Annual Mass Removal Efficiencies for 0.75-inches of Retention for Zone 5**

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	91.4	93.0	92.4	90.8	88.5	85.9	83.0	80.1	77.2	74.4	71.6	69.1	66.7	64.4	62.3	60.2	58.3	56.5	54.8	53.2
35	87.7	90.5	90.4	89.2	87.2	84.8	82.2	79.5	76.7	73.9	71.3	68.8	66.5	64.2	62.1	60.2	58.3	56.5	54.8	53.2
40	83.8	87.6	88.1	87.2	85.7	83.6	81.2	78.7	76.0	73.4	70.9	68.5	66.2	64.1	62.0	60.0	58.2	56.4	54.8	53.2
45	80.0	84.4	85.6	85.1	83.9	82.2	80.0	77.7	75.3	72.8	70.4	68.1	65.9	63.8	61.8	59.9	58.1	56.4	54.7	53.2
50	76.0	81.1	82.7	82.8	82.0	80.5	78.7	76.6	74.4	72.1	69.8	67.7	65.6	63.5	61.6	59.8	58.0	56.3	54.7	53.2
55	72.3	77.7	79.7	80.2	79.8	78.7	77.2	75.3	73.3	71.2	69.2	67.1	65.1	63.2	61.3	59.6	57.9	56.2	54.7	53.2
60	68.9	74.2	76.5	77.4	77.4	76.6	75.4	73.9	72.1	70.2	68.3	66.4	64.6	62.8	61.0	59.3	57.7	56.1	54.6	53.2
65	65.5	70.7	73.3	74.5	74.7	74.4	73.5	72.2	70.7	69.1	67.4	65.7	64.0	62.3	60.7	59.1	57.5	56.0	54.6	53.2
70	62.6	67.4	70.0	71.3	71.9	71.8	71.2	70.3	69.1	67.7	66.3	64.7	63.2	61.7	60.2	58.7	57.3	55.9	54.5	53.2
75	60.1	64.2	66.7	68.1	68.8	68.9	68.7	68.0	67.1	66.1	64.9	63.6	62.3	60.9	59.6	58.3	57.0	55.7	54.4	53.2
80	58.0	61.3	63.5	64.8	65.5	65.9	65.8	65.4	64.8	64.0	63.1	62.1	61.1	60.0	58.9	57.7	56.6	55.4	54.3	53.2
85	56.4	58.8	60.4	61.5	62.2	62.5	62.6	62.4	62.0	61.6	61.0	60.3	59.5	58.7	57.9	57.0	56.0	55.1	54.1	53.2
90	55.1	56.4	57.4	58.1	58.6	58.9	59.0	59.0	58.9	58.7	58.4	58.0	57.6	57.1	56.5	55.9	55.3	54.6	53.9	53.2
95	53.7	54.2	54.6	54.9	55.2	55.4	55.5	55.6	55.6	55.5	55.5	55.3	55.2	55.0	54.7	54.5	54.2	53.9	53.5	53.2
98	53.9	54.0	54.0	54.1	54.1	54.1	54.1	54.1	54.1	54.0	54.0	53.9	53.9	53.8	53.7	53.6	53.5	53.4	53.3	53.2

**Mean Annual Mass Removal Efficiencies for 1.00-inches of Retention for Zone 5**

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	93.5	94.8	94.6	93.7	92.3	90.6	88.7	86.5	84.3	82.1	79.8	77.6	75.4	73.3	71.3	69.4	67.5	65.8	64.1	62.5
35	90.2	92.6	92.9	92.3	91.1	89.6	87.8	85.9	83.8	81.6	79.5	77.3	75.2	73.1	71.2	69.3	67.5	65.7	64.0	62.5
40	87.0	90.2	91.0	90.7	89.7	88.4	86.8	85.0	83.1	81.1	79.0	77.0	74.9	72.9	71.0	69.1	67.4	65.7	64.0	62.5
45	83.7	87.6	88.8	88.8	88.1	87.1	85.7	84.1	82.3	80.4	78.5	76.5	74.6	72.7	70.8	69.0	67.3	65.6	64.0	62.5
50	80.5	84.8	86.4	86.8	86.4	85.5	84.4	83.0	81.4	79.7	77.9	76.0	74.2	72.3	70.5	68.8	67.1	65.5	64.0	62.5
55	77.3	82.0	83.9	84.5	84.4	83.9	83.0	81.8	80.3	78.8	77.1	75.4	73.7	72.0	70.3	68.6	67.0	65.4	63.9	62.5
60	74.4	79.1	81.1	82.0	82.2	82.0	81.3	80.3	79.2	77.8	76.3	74.7	73.1	71.5	69.9	68.3	66.8	65.3	63.9	62.5
65	71.8	76.1	78.3	79.5	79.9	79.9	79.5	78.7	77.8	76.6	75.3	73.9	72.4	71.0	69.5	68.0	66.6	65.2	63.8	62.5
70	69.2	73.2	75.5	76.8	77.4	77.6	77.4	76.9	76.2	75.3	74.2	72.9	71.6	70.3	69.0	67.7	66.3	65.0	63.7	62.5
75	67.0	70.6	72.8	74.1	74.8	75.1	75.1	74.8	74.3	73.6	72.7	71.7	70.7	69.5	68.4	67.2	66.0	64.8	63.6	62.5
80	65.3	68.1	70.0	71.3	72.1	72.5	72.6	72.5	72.2	71.7	71.0	70.3	69.4	68.5	67.6	66.6	65.6	64.5	63.5	62.5
85	63.9	66.0	67.5	68.6	69.3	69.7	69.9	69.9	69.8	69.5	69.0	68.5	67.9	67.2	66.5	65.8	65.0	64.2	63.3	62.5
90	63.0	64.3	65.2	65.9	66.4	66.8	67.0	67.1	67.0	66.9	66.7	66.4	66.1	65.7	65.2	64.7	64.2	63.6	63.1	62.5
95	62.3	62.8	63.1	63.4	63.6	63.8	63.9	64.0	64.1	64.1	64.1	64.0	63.9	63.8	63.6	63.4	63.2	63.0	62.7	62.5
98	62.6	62.7	62.8	62.8	62.9	62.9	62.9	62.9	62.9	62.9	62.9	62.9	62.9	62.8	62.8	62.7	62.7	62.6	62.5	62.5

**Mean Annual Mass Removal Efficiencies for 1.25-inches of Retention for Zone 5**

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	95.1	96.1	96.0	95.4	94.5	93.3	91.9	90.4	88.7	86.9	85.1	83.3	81.5	79.7	77.8	76.1	74.4	72.7	71.1	69.5
35	92.3	94.2	94.5	94.2	93.4	92.4	91.1	89.7	88.2	86.5	84.8	83.0	81.2	79.5	77.7	76.0	74.3	72.6	71.1	69.5
40	89.3	92.0	92.8	92.8	92.2	91.3	90.2	88.9	87.5	85.9	84.3	82.6	80.9	79.2	77.5	75.8	74.2	72.6	71.0	69.5
45	86.5	89.8	90.9	91.2	90.9	90.1	89.2	88.0	86.7	85.3	83.8	82.2	80.6	78.9	77.3	75.7	74.1	72.5	71.0	69.5
50	83.8	87.5	88.9	89.5	89.3	88.8	88.0	87.0	85.8	84.5	83.1	81.7	80.2	78.6	77.0	75.5	73.9	72.4	71.0	69.5
55	81.2	85.1	86.8	87.5	87.5	87.2	86.6	85.8	84.8	83.7	82.4	81.1	79.7	78.2	76.7	75.3	73.8	72.3	70.9	69.5
60	78.6	82.7	84.6	85.4	85.6	85.5	85.1	84.5	83.7	82.7	81.6	80.4	79.1	77.8	76.4	75.0	73.6	72.2	70.9	69.5
65	76.4	80.3	82.2	83.1	83.6	83.7	83.5	83.1	82.4	81.6	80.7	79.6	78.5	77.2	76.0	74.7	73.4	72.1	70.8	69.5
70	74.3	77.7	79.7	80.8	81.5	81.7	81.7	81.4	80.9	80.3	79.5	78.7	77.7	76.6	75.4	74.3	73.1	71.9	70.7	69.5
75	72.4	75.4	77.3	78.5	79.2	79.6	79.7	79.6	79.3	78.8	78.2	77.5	76.7	75.8	74.8	73.8	72.7	71.7	70.6	69.5
80	70.8	73.3	75.1	76.2	76.9	77.4	77.6	77.6	77.4	77.1	76.7	76.2	75.5	74.8	74.0	73.2	72.3	71.4	70.5	69.5
85	69.8	71.6	72.9	73.9	74.6	75.0	75.3	75.4	75.4	75.2	75.0	74.6	74.1	73.6	73.0	72.4	71.7	71.0	70.3	69.5
90	69.2	70.3	71.1	71.8	72.3	72.6	72.9	73.0	73.1	73.1	72.9	72.7	72.5	72.2	71.8	71.4	71.0	70.5	70.0	69.5
95	68.9	69.3	69.7	70.0	70.2	70.4	70.5	70.6	70.7	70.7	70.7	70.7	70.6	70.5	70.4	70.3	70.1	69.9	69.7	69.5
98	69.4	69.5	69.6	69.6	69.7	69.7	69.8	69.8	69.8	69.8	69.8	69.8	69.8	69.8	69.7	69.7	69.7	69.6	69.6	69.5

**Mean Annual Mass Removal Efficiencies for 1.50-inches of Retention for Zone 5**

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	96.3	97.1	97.0	96.5	95.9	95.0	93.9	92.8	91.5	90.2	88.7	87.2	85.7	84.1	82.6	81.1	79.5	78.0	76.5	75.1
35	93.9	95.4	95.6	95.4	95.0	94.2	93.2	92.2	91.0	89.7	88.3	86.9	85.4	83.9	82.4	81.0	79.5	78.0	76.5	75.1
40	91.3	93.5	94.1	94.2	93.9	93.3	92.4	91.5	90.4	89.2	87.9	86.5	85.1	83.7	82.3	80.8	79.4	77.9	76.5	75.1
45	88.8	91.5	92.5	92.8	92.7	92.2	91.5	90.6	89.6	88.6	87.4	86.1	84.8	83.4	82.0	80.6	79.2	77.8	76.4	75.1
50	86.4	89.6	90.8	91.3	91.4	91.0	90.4	89.7	88.8	87.9	86.8	85.6	84.4	83.1	81.8	80.4	79.1	77.7	76.4	75.1
55	84.2	87.5	89.0	89.7	89.8	89.6	89.2	88.6	87.9	87.1	86.1	85.0	83.9	82.7	81.5	80.2	78.9	77.6	76.3	75.1
60	81.9	85.4	87.1	87.9	88.2	88.1	87.9	87.4	86.9	86.2	85.3	84.4	83.3	82.2	81.1	79.9	78.7	77.5	76.3	75.1
65	80.0	83.4	85.1	86.0	86.4	86.5	86.4	86.1	85.7	85.1	84.4	83.6	82.7	81.7	80.7	79.6	78.5	77.4	76.2	75.1
70	78.3	81.3	83.0	84.0	84.5	84.8	84.8	84.7	84.4	83.9	83.4	82.7	81.9	81.1	80.2	79.3	78.2	77.2	76.1	75.1
75	76.6	79.3	80.9	81.9	82.6	83.0	83.1	83.1	82.9	82.6	82.2	81.6	81.0	80.4	79.6	78.8	77.9	77.0	76.0	75.1
80	75.3	77.4	78.9	79.9	80.6	81.1	81.3	81.4	81.3	81.1	80.8	80.4	80.0	79.5	78.9	78.2	77.5	76.7	75.9	75.1
85	74.4	76.0	77.2	78.0	78.7	79.1	79.4	79.5	79.5	79.5	79.3	79.1	78.8	78.4	78.0	77.5	76.9	76.3	75.7	75.1
90	73.9	74.9	75.7	76.3	76.8	77.1	77.4	77.6	77.7	77.7	77.7	77.6	77.4	77.2	76.9	76.6	76.3	75.9	75.5	75.1
95	74.0	74.4	74.7	75.0	75.2	75.4	75.6	75.7	75.8	75.9	75.9	75.9	75.9	75.8	75.7	75.6	75.5	75.4	75.2	75.1
98	74.8	74.9	75.0	75.0	75.1	75.1	75.1	75.2	75.2	75.2	75.2	75.2	75.2	75.2	75.2	75.2	75.2	75.1	75.1	75.1

### Mean Annual Mass Removal Efficiencies for 1.75-inches of Retention for Zone 5

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	97.2	97.7	97.7	97.4	96.8	96.2	95.4	94.4	93.5	92.4	91.2	90.0	88.7	87.4	86.1	84.8	83.4	82.1	80.8	79.4
35	95.1	96.3	96.6	96.4	96.0	95.5	94.7	93.9	93.0	91.9	90.8	89.7	88.5	87.2	85.9	84.6	83.3	82.0	80.7	79.4
40	92.9	94.7	95.2	95.2	95.0	94.6	94.0	93.2	92.4	91.4	90.4	89.3	88.2	87.0	85.7	84.5	83.2	82.0	80.7	79.4
45	90.7	93.0	93.7	94.0	94.0	93.7	93.2	92.5	91.7	90.9	89.9	88.9	87.8	86.7	85.5	84.3	83.1	81.9	80.7	79.4
50	88.5	91.2	92.2	92.7	92.8	92.6	92.2	91.7	91.0	90.2	89.4	88.4	87.4	86.4	85.3	84.1	83.0	81.8	80.6	79.4
55	86.5	89.4	90.7	91.3	91.5	91.5	91.2	90.7	90.2	89.5	88.7	87.9	87.0	86.0	85.0	83.9	82.8	81.7	80.6	79.4
60	84.6	87.5	89.0	89.8	90.2	90.2	90.0	89.6	89.2	88.6	88.0	87.3	86.4	85.6	84.6	83.6	82.6	81.6	80.5	79.4
65	82.9	85.8	87.4	88.3	88.6	88.7	88.7	88.5	88.1	87.7	87.2	86.6	85.8	85.1	84.2	83.3	82.4	81.4	80.5	79.4
70	81.4	84.1	85.6	86.5	87.0	87.2	87.2	87.2	87.0	86.6	86.2	85.7	85.1	84.5	83.7	83.0	82.1	81.3	80.4	79.4
75	80.2	82.4	83.8	84.7	85.2	85.6	85.8	85.8	85.7	85.5	85.2	84.8	84.3	83.8	83.2	82.5	81.8	81.1	80.3	79.4
80	78.9	80.8	82.0	82.9	83.5	84.0	84.2	84.3	84.3	84.2	84.0	83.7	83.4	83.0	82.5	82.0	81.4	80.8	80.1	79.4
85	78.1	79.5	80.5	81.3	81.9	82.3	82.6	82.8	82.8	82.8	82.7	82.5	82.3	82.1	81.7	81.4	81.0	80.5	80.0	79.4
90	77.8	78.6	79.3	79.9	80.4	80.7	80.9	81.1	81.2	81.3	81.3	81.2	81.1	81.0	80.9	80.6	80.4	80.1	79.8	79.4
95	78.0	78.4	78.7	78.9	79.1	79.3	79.5	79.6	79.7	79.8	79.9	79.9	79.9	79.9	79.9	79.8	79.8	79.7	79.6	79.4
98	79.0	79.0	79.1	79.2	79.2	79.3	79.3	79.4	79.4	79.4	79.5	79.5	79.5	79.5	79.5	79.5	79.5	79.5	79.5	79.4

### Mean Annual Mass Removal Efficiencies for 2.00-inches of Retention for Zone 5

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	97.8	98.3	98.3	98.0	97.5	97.0	96.4	95.6	94.8	93.9	93.0	92.0	91.0	89.9	88.7	87.6	86.4	85.2	84.0	82.9
35	96.2	97.1	97.3	97.1	96.8	96.3	95.8	95.1	94.4	93.6	92.7	91.7	90.7	89.7	88.6	87.4	86.3	85.2	84.0	82.9
40	94.3	95.7	96.1	96.1	95.9	95.6	95.2	94.5	93.8	93.1	92.3	91.4	90.4	89.4	88.4	87.3	86.2	85.1	84.0	82.9
45	92.3	94.2	94.8	95.0	94.9	94.8	94.4	93.9	93.3	92.6	91.8	91.0	90.1	89.2	88.2	87.1	86.1	85.0	83.9	82.9
50	90.3	92.5	93.4	93.8	93.9	93.8	93.6	93.1	92.6	92.0	91.3	90.5	89.7	88.8	87.9	87.0	86.0	84.9	83.9	82.9
55	88.4	90.9	92.0	92.6	92.8	92.8	92.6	92.3	91.8	91.3	90.7	90.0	89.3	88.5	87.6	86.7	85.8	84.8	83.9	82.9
60	86.8	89.3	90.6	91.3	91.6	91.7	91.6	91.3	91.0	90.6	90.0	89.4	88.8	88.1	87.3	86.5	85.6	84.7	83.8	82.9
65	85.3	87.7	89.1	90.0	90.4	90.5	90.5	90.3	90.0	89.7	89.3	88.8	88.2	87.6	86.9	86.2	85.4	84.6	83.7	82.9
70	83.9	86.3	87.7	88.5	88.9	89.2	89.2	89.1	89.0	88.8	88.4	88.0	87.6	87.1	86.5	85.8	85.1	84.4	83.7	82.9
75	82.9	84.9	86.2	87.0	87.4	87.7	87.9	87.9	87.9	87.7	87.5	87.2	86.9	86.4	86.0	85.4	84.8	84.2	83.6	82.9
80	81.9	83.5	84.6	85.4	85.9	86.3	86.5	86.7	86.7	86.6	86.5	86.3	86.1	85.7	85.4	84.9	84.5	84.0	83.4	82.9
85	81.1	82.3	83.3	84.0	84.5	84.9	85.1	85.3	85.4	85.4	85.4	85.3	85.1	84.9	84.7	84.4	84.1	83.7	83.3	82.9
90	80.9	81.7	82.3	82.8	83.2	83.5	83.8	84.0	84.1	84.2	84.2	84.2	84.1	84.0	83.9	83.8	83.6	83.4	83.1	82.9
95	81.3	81.6	81.9	82.1	82.3	82.5	82.6	82.8	82.9	83.0	83.0	83.1	83.1	83.1	83.1	83.1	83.1	83.0	82.9	82.9
98	82.3	82.3	82.4	82.5	82.5	82.6	82.6	82.7	82.7	82.7	82.8	82.8	82.8	82.8	82.9	82.9	82.9	82.9	82.9	82.9

**Mean Annual Mass Removal Efficiencies for 2.25-inches of Retention for Zone 5**

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	98.2	98.7	98.6	98.5	98.1	97.6	97.1	96.5	95.9	95.1	94.3	93.5	92.6	91.7	90.7	89.7	88.7	87.7	86.6	85.6
35	97.0	97.7	97.8	97.7	97.5	97.0	96.6	96.1	95.4	94.7	94.0	93.2	92.4	91.5	90.6	89.6	88.6	87.6	86.6	85.6
40	95.3	96.5	96.9	96.8	96.6	96.3	96.0	95.5	95.0	94.3	93.6	92.9	92.1	91.3	90.4	89.5	88.5	87.6	86.6	85.6
45	93.6	95.2	95.7	95.8	95.7	95.6	95.3	94.9	94.4	93.9	93.2	92.6	91.8	91.0	90.2	89.3	88.4	87.5	86.5	85.6
50	91.9	93.7	94.5	94.7	94.8	94.8	94.6	94.3	93.8	93.3	92.8	92.1	91.5	90.7	90.0	89.1	88.3	87.4	86.5	85.6
55	90.1	92.2	93.2	93.6	93.8	93.9	93.8	93.5	93.2	92.7	92.2	91.7	91.1	90.4	89.7	88.9	88.1	87.3	86.5	85.6
60	88.6	90.8	91.9	92.5	92.8	92.9	92.9	92.7	92.4	92.0	91.6	91.1	90.6	90.0	89.4	88.7	88.0	87.2	86.4	85.6
65	87.2	89.4	90.6	91.3	91.7	91.9	91.9	91.8	91.6	91.3	90.9	90.6	90.1	89.6	89.0	88.4	87.8	87.1	86.3	85.6
70	86.0	88.1	89.3	90.1	90.6	90.8	90.8	90.8	90.6	90.4	90.2	89.9	89.5	89.1	88.6	88.1	87.5	86.9	86.3	85.6
75	85.1	87.0	88.1	88.8	89.3	89.5	89.6	89.7	89.6	89.6	89.4	89.1	88.9	88.5	88.2	87.7	87.2	86.7	86.2	85.6
80	84.5	85.8	86.8	87.5	87.9	88.2	88.4	88.6	88.6	88.6	88.5	88.3	88.1	87.9	87.6	87.3	86.9	86.5	86.1	85.6
85	83.8	84.8	85.6	86.1	86.6	87.0	87.2	87.4	87.5	87.5	87.5	87.5	87.4	87.2	87.0	86.8	86.5	86.3	85.9	85.6
90	83.5	84.2	84.7	85.2	85.6	85.8	86.1	86.2	86.4	86.5	86.5	86.5	86.5	86.5	86.4	86.3	86.1	86.0	85.8	85.6
95	83.9	84.2	84.5	84.7	84.9	85.1	85.2	85.3	85.4	85.5	85.6	85.6	85.7	85.7	85.7	85.7	85.7	85.7	85.6	85.6
98	84.9	85.0	85.1	85.1	85.2	85.2	85.3	85.3	85.4	85.4	85.4	85.5	85.5	85.5	85.5	85.5	85.6	85.6	85.6	85.6

**Mean Annual Mass Removal Efficiencies for 2.50-inches of Retention for Zone 5**

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	98.6	98.9	98.9	98.8	98.6	98.2	97.7	97.2	96.7	96.0	95.3	94.6	93.9	93.1	92.3	91.4	90.6	89.6	88.7	87.8
35	97.6	98.1	98.3	98.2	98.0	97.6	97.2	96.8	96.3	95.7	95.0	94.4	93.7	92.9	92.1	91.3	90.5	89.6	88.7	87.8
40	96.2	97.1	97.4	97.4	97.3	97.0	96.7	96.3	95.9	95.3	94.7	94.1	93.4	92.7	92.0	91.2	90.4	89.5	88.7	87.8
45	94.7	96.0	96.5	96.5	96.5	96.3	96.0	95.8	95.4	94.9	94.3	93.8	93.2	92.5	91.8	91.0	90.3	89.5	88.6	87.8
50	93.2	94.8	95.3	95.6	95.6	95.5	95.4	95.2	94.8	94.4	93.9	93.4	92.8	92.2	91.6	90.9	90.1	89.4	88.6	87.8
55	91.6	93.4	94.2	94.5	94.7	94.7	94.7	94.5	94.2	93.9	93.4	93.0	92.5	91.9	91.3	90.7	90.0	89.3	88.5	87.8
60	90.1	92.0	93.0	93.5	93.8	93.9	93.9	93.8	93.5	93.2	92.9	92.5	92.0	91.6	91.0	90.4	89.8	89.2	88.5	87.8
65	88.9	90.8	91.8	92.4	92.8	93.0	93.1	93.0	92.8	92.6	92.3	92.0	91.6	91.2	90.7	90.2	89.6	89.1	88.4	87.8
70	87.8	89.6	90.7	91.4	91.8	92.1	92.1	92.1	92.0	91.8	91.6	91.4	91.1	90.7	90.3	89.9	89.4	88.9	88.4	87.8
75	86.9	88.6	89.6	90.3	90.8	91.0	91.1	91.1	91.1	91.0	90.9	90.7	90.5	90.2	89.9	89.5	89.2	88.7	88.3	87.8
80	86.4	87.7	88.6	89.2	89.6	89.9	90.0	90.1	90.2	90.2	90.1	90.0	89.8	89.7	89.4	89.2	88.9	88.5	88.2	87.8
85	85.9	86.9	87.5	88.0	88.4	88.7	88.9	89.1	89.2	89.3	89.3	89.2	89.2	89.1	88.9	88.8	88.6	88.3	88.1	87.8
90	85.6	86.2	86.7	87.1	87.5	87.8	88.0	88.1	88.3	88.4	88.4	88.4	88.4	88.4	88.4	88.3	88.2	88.1	87.9	87.8
95	86.1	86.4	86.6	86.8	87.0	87.1	87.3	87.4	87.5	87.6	87.7	87.7	87.8	87.8	87.8	87.8	87.8	87.8	87.8	87.8
98	87.1	87.2	87.2	87.3	87.3	87.4	87.4	87.5	87.5	87.6	87.6	87.6	87.7	87.7	87.7	87.7	87.7	87.8	87.8	87.8

**Mean Annual Mass Removal Efficiencies for 2.75-inches of Retention for Zone 5**

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	98.9	99.1	99.1	99.1	98.9	98.6	98.2	97.8	97.3	96.7	96.2	95.5	94.9	94.2	93.5	92.8	92.0	91.2	90.4	89.6
35	98.1	98.5	98.6	98.6	98.4	98.1	97.7	97.4	96.9	96.4	95.9	95.3	94.7	94.1	93.4	92.7	91.9	91.2	90.4	89.6
40	97.0	97.7	97.9	97.9	97.8	97.5	97.2	96.9	96.5	96.1	95.6	95.0	94.5	93.9	93.2	92.5	91.8	91.1	90.3	89.6
45	95.6	96.7	97.1	97.1	97.1	96.9	96.6	96.4	96.1	95.7	95.2	94.7	94.2	93.6	93.0	92.4	91.7	91.0	90.3	89.6
50	94.3	95.6	96.1	96.3	96.3	96.2	96.0	95.8	95.6	95.3	94.9	94.4	93.9	93.4	92.8	92.2	91.6	91.0	90.3	89.6
55	92.9	94.4	95.0	95.3	95.4	95.4	95.4	95.3	95.1	94.8	94.4	94.0	93.6	93.1	92.6	92.1	91.5	90.9	90.2	89.6
60	91.6	93.2	93.9	94.3	94.6	94.7	94.7	94.6	94.5	94.2	93.9	93.6	93.2	92.8	92.3	91.8	91.3	90.8	90.2	89.6
65	90.3	92.0	92.8	93.4	93.7	93.9	94.0	93.9	93.8	93.6	93.4	93.1	92.8	92.4	92.0	91.6	91.1	90.6	90.1	89.6
70	89.3	90.9	91.8	92.4	92.8	93.1	93.2	93.2	93.1	93.0	92.8	92.6	92.3	92.0	91.7	91.3	90.9	90.5	90.1	89.6
75	88.5	89.9	90.9	91.5	91.9	92.2	92.3	92.4	92.3	92.2	92.1	92.0	91.8	91.6	91.3	91.0	90.7	90.4	90.0	89.6
80	88.1	89.2	90.0	90.6	91.0	91.2	91.4	91.5	91.5	91.5	91.4	91.4	91.3	91.1	90.9	90.7	90.5	90.2	89.9	89.6
85	87.8	88.6	89.2	89.6	90.0	90.2	90.4	90.5	90.6	90.7	90.7	90.7	90.7	90.6	90.5	90.3	90.2	90.0	89.8	89.6
90	87.5	88.0	88.4	88.8	89.1	89.3	89.5	89.7	89.8	89.9	90.0	90.0	90.0	90.0	90.0	89.9	89.9	89.8	89.7	89.6
95	87.9	88.2	88.4	88.6	88.7	88.9	89.0	89.1	89.2	89.3	89.4	89.4	89.5	89.5	89.5	89.6	89.6	89.6	89.6	89.6
98	88.9	88.9	89.0	89.0	89.1	89.1	89.2	89.2	89.3	89.3	89.4	89.4	89.4	89.5	89.5	89.5	89.5	89.5	89.6	89.6

**Mean Annual Mass Removal Efficiencies for 3.00-inches of Retention for Zone 5**

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	99.1	99.3	99.3	99.2	99.1	98.9	98.6	98.2	97.8	97.3	96.8	96.3	95.7	95.1	94.5	93.8	93.2	92.5	91.8	91.0
35	98.4	98.8	98.9	98.8	98.7	98.5	98.2	97.8	97.5	97.0	96.6	96.1	95.5	94.9	94.4	93.7	93.1	92.4	91.7	91.0
40	97.5	98.1	98.3	98.3	98.2	98.0	97.7	97.4	97.1	96.7	96.3	95.8	95.3	94.8	94.2	93.6	93.0	92.4	91.7	91.0
45	96.4	97.3	97.6	97.6	97.6	97.4	97.2	96.9	96.7	96.4	96.0	95.5	95.1	94.6	94.0	93.5	92.9	92.3	91.7	91.0
50	95.2	96.3	96.7	96.9	96.9	96.8	96.6	96.4	96.2	96.0	95.6	95.2	94.8	94.3	93.9	93.4	92.8	92.2	91.6	91.0
55	94.0	95.3	95.8	96.0	96.1	96.1	96.0	95.9	95.7	95.5	95.2	94.9	94.5	94.1	93.6	93.2	92.7	92.2	91.6	91.0
60	92.8	94.1	94.8	95.1	95.3	95.4	95.4	95.3	95.2	95.0	94.8	94.5	94.1	93.8	93.4	93.0	92.5	92.1	91.6	91.0
65	91.7	93.0	93.8	94.2	94.5	94.6	94.7	94.7	94.6	94.5	94.3	94.0	93.8	93.5	93.1	92.8	92.4	91.9	91.5	91.0
70	90.7	92.0	92.8	93.3	93.7	93.9	94.0	94.1	94.0	93.9	93.8	93.6	93.3	93.1	92.8	92.5	92.2	91.8	91.4	91.0
75	89.9	91.1	91.9	92.5	92.9	93.2	93.3	93.3	93.3	93.3	93.2	93.0	92.9	92.7	92.5	92.3	92.0	91.7	91.4	91.0
80	89.4	90.5	91.2	91.7	92.1	92.3	92.5	92.6	92.6	92.6	92.5	92.5	92.4	92.3	92.1	92.0	91.8	91.5	91.3	91.0
85	89.3	90.0	90.5	90.9	91.3	91.5	91.6	91.8	91.8	91.9	91.9	91.9	91.9	91.8	91.7	91.6	91.5	91.4	91.2	91.0
90	89.1	89.6	89.9	90.2	90.5	90.7	90.9	91.0	91.1	91.2	91.3	91.3	91.3	91.4	91.3	91.3	91.3	91.2	91.1	91.0
95	89.5	89.7	89.9	90.0	90.2	90.3	90.4	90.5	90.6	90.7	90.8	90.8	90.9	90.9	91.0	91.0	91.0	91.0	91.0	91.0
98	90.3	90.4	90.5	90.5	90.6	90.6	90.6	90.7	90.7	90.8	90.8	90.8	90.9	90.9	90.9	90.9	91.0	91.0	91.0	91.0

**Mean Annual Mass Removal Efficiencies for 3.25-inches of Retention for Zone 5**

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	99.3	99.4	99.5	99.4	99.3	99.1	98.9	98.6	98.2	97.8	97.4	96.9	96.4	95.8	95.3	94.7	94.1	93.5	92.9	92.2
35	98.7	99.0	99.1	99.0	99.0	98.8	98.5	98.2	97.9	97.5	97.1	96.7	96.2	95.7	95.2	94.6	94.1	93.5	92.9	92.2
40	98.0	98.4	98.6	98.6	98.5	98.4	98.1	97.8	97.5	97.2	96.9	96.5	96.0	95.5	95.0	94.5	94.0	93.4	92.8	92.2
45	97.0	97.7	98.0	98.0	98.0	97.8	97.7	97.4	97.1	96.9	96.6	96.2	95.8	95.3	94.9	94.4	93.9	93.4	92.8	92.2
50	96.0	96.9	97.3	97.4	97.4	97.3	97.1	96.9	96.7	96.5	96.3	95.9	95.5	95.1	94.7	94.3	93.8	93.3	92.8	92.2
55	94.9	96.0	96.4	96.6	96.7	96.7	96.6	96.4	96.3	96.1	95.9	95.6	95.3	94.9	94.5	94.1	93.7	93.2	92.7	92.2
60	93.9	95.0	95.5	95.8	96.0	96.0	96.0	95.9	95.8	95.7	95.5	95.2	94.9	94.6	94.3	93.9	93.5	93.1	92.7	92.2
65	92.8	94.0	94.6	95.0	95.2	95.3	95.4	95.4	95.3	95.2	95.0	94.8	94.6	94.3	94.0	93.7	93.4	93.0	92.6	92.2
70	91.9	93.0	93.7	94.1	94.4	94.6	94.8	94.8	94.8	94.7	94.6	94.4	94.2	94.0	93.8	93.5	93.2	92.9	92.6	92.2
75	91.1	92.2	92.9	93.4	93.7	94.0	94.1	94.2	94.2	94.1	94.1	94.0	93.8	93.6	93.5	93.3	93.0	92.8	92.5	92.2
80	90.6	91.5	92.2	92.7	93.0	93.3	93.4	93.5	93.5	93.6	93.5	93.4	93.4	93.3	93.2	93.0	92.8	92.6	92.4	92.2
85	90.5	91.2	91.7	92.0	92.3	92.5	92.7	92.8	92.9	92.9	92.9	92.9	92.9	92.9	92.8	92.7	92.6	92.5	92.4	92.2
90	90.5	90.9	91.2	91.5	91.7	91.9	92.0	92.1	92.2	92.3	92.4	92.4	92.4	92.5	92.4	92.4	92.4	92.3	92.3	92.2
95	90.7	90.9	91.1	91.2	91.4	91.5	91.6	91.7	91.8	91.9	92.0	92.0	92.1	92.1	92.1	92.2	92.2	92.2	92.2	92.2
98	91.6	91.6	91.7	91.7	91.8	91.8	91.8	91.9	91.9	92.0	92.0	92.0	92.1	92.1	92.1	92.1	92.2	92.2	92.2	92.2

**Mean Annual Mass Removal Efficiencies for 3.50-inches of Retention for Zone 5**

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	99.5	99.6	99.6	99.5	99.4	99.3	99.1	98.9	98.5	98.2	97.8	97.4	96.9	96.5	96.0	95.4	94.9	94.4	93.8	93.2
35	98.9	99.2	99.2	99.2	99.1	99.0	98.8	98.6	98.3	97.9	97.6	97.2	96.8	96.3	95.8	95.4	94.9	94.3	93.8	93.2
40	98.3	98.7	98.8	98.8	98.8	98.7	98.5	98.2	97.9	97.6	97.3	97.0	96.6	96.2	95.7	95.3	94.8	94.3	93.8	93.2
45	97.5	98.1	98.3	98.4	98.3	98.2	98.0	97.8	97.6	97.3	97.1	96.8	96.4	96.0	95.6	95.1	94.7	94.2	93.7	93.2
50	96.6	97.4	97.7	97.8	97.8	97.7	97.6	97.4	97.2	97.0	96.7	96.5	96.1	95.8	95.4	95.0	94.6	94.2	93.7	93.2
55	95.7	96.6	97.0	97.2	97.2	97.2	97.1	96.9	96.8	96.6	96.4	96.2	95.9	95.6	95.2	94.9	94.5	94.1	93.7	93.2
60	94.8	95.8	96.2	96.4	96.5	96.5	96.5	96.4	96.3	96.2	96.1	95.9	95.6	95.3	95.0	94.7	94.4	94.0	93.6	93.2
65	93.8	94.8	95.4	95.7	95.8	95.9	95.9	95.9	95.9	95.8	95.7	95.5	95.3	95.1	94.8	94.5	94.2	93.9	93.6	93.2
70	93.0	94.0	94.5	94.9	95.1	95.3	95.4	95.4	95.4	95.4	95.3	95.1	95.0	94.8	94.5	94.3	94.1	93.8	93.5	93.2
75	92.2	93.1	93.7	94.1	94.4	94.7	94.8	94.9	94.9	94.9	94.8	94.7	94.6	94.4	94.3	94.1	93.9	93.7	93.5	93.2
80	91.7	92.5	93.1	93.5	93.8	94.1	94.2	94.3	94.3	94.3	94.3	94.3	94.2	94.1	94.0	93.9	93.7	93.6	93.4	93.2
85	91.5	92.1	92.6	93.0	93.2	93.4	93.6	93.7	93.7	93.8	93.8	93.8	93.8	93.7	93.7	93.6	93.6	93.5	93.3	93.2
90	91.6	91.9	92.2	92.5	92.7	92.9	93.0	93.1	93.2	93.2	93.3	93.3	93.4	93.4	93.4	93.4	93.4	93.3	93.3	93.2
95	91.9	92.0	92.2	92.3	92.4	92.5	92.6	92.7	92.8	92.9	92.9	93.0	93.1	93.1	93.1	93.2	93.2	93.2	93.2	93.2
98	92.6	92.6	92.7	92.7	92.8	92.8	92.9	92.9	92.9	93.0	93.0	93.0	93.1	93.1	93.1	93.1	93.2	93.2	93.2	93.2

### Mean Annual Mass Removal Efficiencies for 3.75-inches of Retention for Zone 5

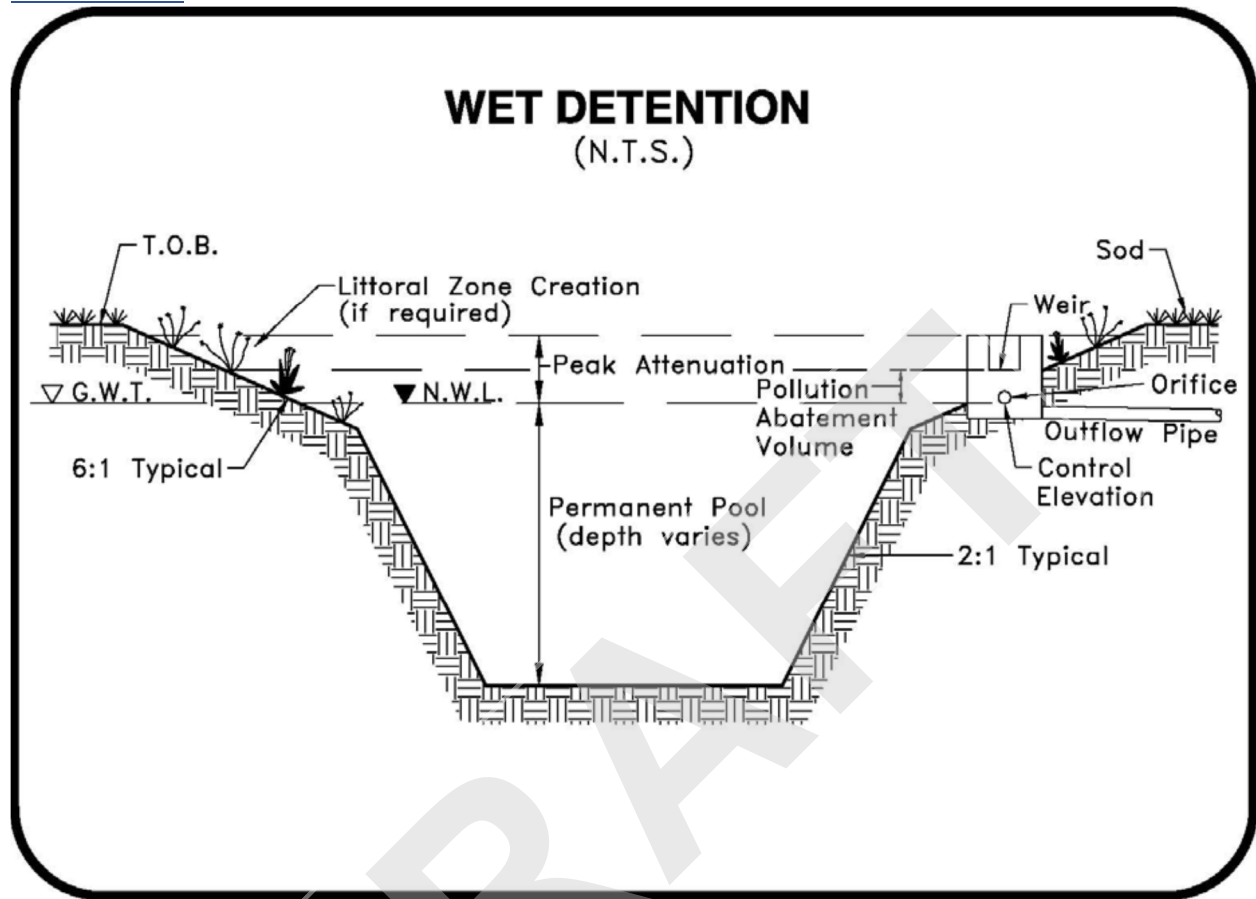
NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	99.7	99.7	99.7	99.6	99.5	99.4	99.3	99.1	98.8	98.5	98.2	97.8	97.4	97.0	96.5	96.1	95.6	95.1	94.6	94.1
35	99.1	99.3	99.4	99.3	99.3	99.2	99.0	98.8	98.6	98.3	98.0	97.6	97.3	96.9	96.4	96.0	95.5	95.1	94.6	94.1
40	98.6	98.9	99.0	99.0	99.0	98.9	98.7	98.5	98.3	98.0	97.7	97.4	97.1	96.7	96.3	95.9	95.4	95.0	94.5	94.1
45	97.9	98.4	98.6	98.6	98.6	98.5	98.4	98.2	98.0	97.7	97.5	97.2	96.9	96.5	96.2	95.8	95.4	95.0	94.5	94.1
50	97.1	97.8	98.1	98.2	98.2	98.1	98.0	97.8	97.6	97.4	97.2	96.9	96.7	96.4	96.0	95.7	95.3	94.9	94.5	94.1
55	96.4	97.1	97.5	97.6	97.6	97.6	97.5	97.4	97.2	97.0	96.9	96.7	96.4	96.2	95.9	95.5	95.2	94.8	94.5	94.1
60	95.5	96.4	96.8	96.9	97.0	97.0	97.0	96.9	96.8	96.7	96.6	96.4	96.2	95.9	95.7	95.4	95.1	94.7	94.4	94.1
65	94.7	95.5	96.0	96.3	96.4	96.5	96.4	96.4	96.4	96.3	96.2	96.1	95.9	95.7	95.5	95.2	94.9	94.7	94.4	94.1
70	93.9	94.7	95.3	95.5	95.7	95.8	95.9	95.9	95.9	95.9	95.9	95.7	95.6	95.4	95.2	95.0	94.8	94.6	94.3	94.1
75	93.2	94.0	94.5	94.8	95.1	95.2	95.4	95.5	95.5	95.5	95.4	95.4	95.3	95.1	95.0	94.8	94.7	94.5	94.3	94.1
80	92.6	93.3	93.8	94.2	94.5	94.7	94.9	95.0	95.0	95.0	95.0	95.0	94.9	94.8	94.7	94.6	94.5	94.4	94.2	94.1
85	92.5	93.0	93.4	93.8	94.0	94.2	94.3	94.4	94.5	94.5	94.5	94.6	94.5	94.5	94.4	94.4	94.3	94.3	94.2	94.1
90	92.6	92.9	93.1	93.3	93.5	93.7	93.8	93.9	94.0	94.1	94.1	94.1	94.2	94.2	94.2	94.2	94.2	94.1	94.1	94.1
95	92.9	93.0	93.1	93.2	93.3	93.4	93.5	93.6	93.7	93.7	93.8	93.8	93.9	93.9	94.0	94.0	94.0	94.0	94.0	94.1
98	93.5	93.5	93.6	93.6	93.6	93.7	93.7	93.8	93.8	93.8	93.9	93.9	93.9	93.9	94.0	94.0	94.0	94.0	94.0	94.1

### Mean Annual Mass Removal Efficiencies for 4.00-inches of Retention for Zone 5

NDCIA CN	Percent DCIA																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	99.8	99.8	99.7	99.7	99.6	99.5	99.4	99.2	99.0	98.8	98.5	98.1	97.8	97.4	97.0	96.6	96.2	95.7	95.2	94.8
35	99.3	99.5	99.5	99.5	99.4	99.3	99.2	99.0	98.8	98.6	98.3	98.0	97.7	97.3	96.9	96.5	96.1	95.7	95.2	94.8
40	98.8	99.1	99.2	99.2	99.1	99.1	99.0	98.8	98.6	98.3	98.1	97.8	97.5	97.2	96.8	96.4	96.0	95.6	95.2	94.8
45	98.3	98.6	98.8	98.8	98.8	98.8	98.6	98.5	98.3	98.1	97.8	97.6	97.3	97.0	96.7	96.3	96.0	95.6	95.2	94.8
50	97.6	98.1	98.4	98.4	98.5	98.4	98.3	98.1	98.0	97.8	97.5	97.3	97.1	96.8	96.5	96.2	95.9	95.5	95.1	94.8
55	96.9	97.6	97.8	98.0	98.0	97.9	97.9	97.7	97.6	97.4	97.3	97.1	96.9	96.7	96.4	96.1	95.8	95.4	95.1	94.8
60	96.2	96.9	97.2	97.4	97.5	97.5	97.4	97.3	97.2	97.1	97.0	96.8	96.7	96.4	96.2	96.0	95.7	95.4	95.1	94.8
65	95.5	96.2	96.6	96.8	96.9	96.9	96.9	96.9	96.8	96.8	96.7	96.6	96.4	96.2	96.0	95.8	95.6	95.3	95.0	94.8
70	94.7	95.4	95.9	96.2	96.3	96.4	96.4	96.4	96.4	96.4	96.3	96.3	96.1	96.0	95.8	95.6	95.4	95.2	95.0	94.8
75	94.1	94.8	95.2	95.5	95.7	95.8	95.9	96.0	96.0	96.0	96.0	95.9	95.8	95.7	95.6	95.5	95.3	95.1	95.0	94.8
80	93.5	94.1	94.5	94.9	95.1	95.3	95.4	95.5	95.6	95.6	95.6	95.6	95.5	95.4	95.4	95.3	95.1	95.0	94.9	94.8
85	93.3	93.8	94.1	94.4	94.7	94.8	95.0	95.1	95.1	95.2	95.2	95.2	95.2	95.2	95.1	95.1	95.0	94.9	94.9	94.8
90	93.4	93.7	93.9	94.1	94.3	94.4	94.5	94.6	94.7	94.8	94.8	94.8	94.8	94.9	94.9	94.9	94.8	94.8	94.8	94.8
95	93.7	93.8	93.9	94.0	94.1	94.2	94.3	94.3	94.4	94.5	94.5	94.6	94.6	94.6	94.7	94.7	94.7	94.7	94.8	94.8
98	94.2	94.3	94.3	94.3	94.4	94.4	94.4	94.5	94.5	94.5	94.6	94.6	94.6	94.6	94.7	94.7	94.7	94.7	94.8	94.8



Wet Detention



The most significant factor impacting the performance efficiency of a wet detention pond is the residence time within the system - specifically, the volume of the permanent pool with respect to the volume of runoff entering the pond. Since the specified treatment volumes are negligible in comparison to the permanent pool volume contained within the wet detention pond, the treatment volume criteria primarily regulates the drawdown characteristics of the wet detention pond and has little impact on the overall water quality performance efficiency of the system.

Residence time within a wet detention pond is determined by the relationship between the permanent pool volume and the annual runoff inputs, as follows:

$$\text{Average Annual Detention Time, } t_d(\text{days}) = \frac{PPV}{RO} \times \frac{365 \text{ days}}{\text{year}}$$

where:

PPV = permanent pool volume (ac-ft)

RO = annual runoff inputs (ac-ft/yr)

For purposes of this calculation, the permanent pool volume is considered to include the total volume of water within the pond below the control elevation.

Table: Limits to Average Annual Residence Time throughout the State

<u>Maximum Average Annual Residence Time</u>	<u>Maximum Treatment Efficiency for TP</u>	<u>Maximum Treatment Efficiency for TN</u>
31 Days	64.52	38.33

TP percent removal equation

$$\text{Percent TP Removal} = 40.13 + 6.372 * \ln(t_d) + 0.213 * (\ln(t_d))^2$$

$t_d = \text{Average Annual Residence Time (days)}$

TN percent removal equation

$$\text{Percent TN Removal} = \frac{43.75 * t_d}{(4.38 + t_d)}$$

$t_d = \text{Average Annual Residence Time (days)}$

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### Detention with Engineered Media and Filtration

The treatment efficiency for these systems is calculated based on the following equation:

$$\begin{aligned} & \textit{Treatment efficiency for Detention Pond with Filtration} \\ & = \textit{(Detention efficiency for Volume of the water Detained in the system )} \\ & + \textit{(Volume of water filtered and not detained} \\ & * \textit{Treatment Efficiency of Media)} \end{aligned}$$

### Green Stormwater Infrastructure

GSI and LID reduces pollution and treats stormwater by retaining rainfall near its source instead of directing it to a centralized pond or treatment system. When applied early in the design process, low impact design techniques can reduce stormwater runoff volume and pollutants generated from project sites. Thus, the use of GSI and LID may reduce stormwater treatment BMP size requirements. GSI and LID, depending on the technology, can also treat stormwater similar to a traditional BMP by treating TN and TP as a retention system.

### Swale

Swales are defined in Chapter 403.803(14), Florida Statutes, as follows: “Swale means a manmade trench which:

1. Has a top width to depth ratio of the cross-section equal to or greater than 6:1, or side slopes equal to or flatter than 3 feet horizontal to 1-foot vertical;
2. Contains contiguous areas of standing or flowing water only following a rainfall event;
3. Is planted with or has stabilized vegetation suitable for soil stabilization, stormwater treatment, and nutrient uptake; and
4. Is designed to take into account the soil erodibility, soil percolation, slope, slope length, and drainage area so as to prevent erosion and reduce pollutant concentration of any discharge.”

Swales are online retention systems and their treatment effectiveness is directly related to the amount of the annual stormwater volume that is infiltrated. Swales designed for stormwater treatment can be classified into two categories:

- Swales with swale blocks or raised driveway culverts
- Swales without swale blocks or raised driveway culverts

### Raingarden/Bioretenion Cell

Bioretention cells, or commonly referred to as rain gardens, are shallow depressions with resilient plants that can handle temporary inundation/flooding and periods of drought. They allow stormwater to collect and soak directly into the soil.

Rain gardens vary in size and complexity. They can be planted to provide a food source for butterflies and other wildlife and can make a beautiful addition to the landscape.

### Green Roof

A green roof is a vegetated roof system where rainwater is taken up by plants and transpired into the air to reduce rainwater runoff from the roof. Green roofs provide an extra layer of insulation that reduces heating and cooling costs and are likely to extend the life of the roof by up to 10-20 years. Green roof vegetation enhances the building’s appearance, improves air quality and reduces the urban heat island effect.

Well-designed green roofs include subsystems for drainage, plant nourishment and support, and protect underlying waterproofing systems. Green roofs maintain growing conditions and manage heavy rainfall without sustaining damage from high winds, erosion or pooling water. Green roof engineered soil meets specific requirements, including grain-size, air spaces and moisture retention to store rainfall and support plants that meet site-specific “right plant-right place” requirements.

#### Bio Swale

A Bioswale is an alternative to concrete gutters and storm sewers for directing stormwater away from roadways or structures. They use vegetated low-lying areas and specialized soil mixes to treat, absorb and convey lower volumes of stormwater runoff to larger treatment systems.

In many ways, bioswales imitate the function of small natural creeks or streams. Because they are linear, bioswales are effective when placed along streets and within parking lots. Essentially a shallow trench or ditch, bioswales can be cost-effective to implement and can help slow foot traffic near businesses.

Bioswales provide landscaping that, depending on the plant species chosen, may create habitats for birds, butterflies and local wildlife.

#### Tree Well

Tree boxes provide direct filtration of runoff while also intercepting rain as it falls onto the leaves and branches of the non-invasive plant life. Tree boxes also reduce the urban heat island effect, offer shady relief from the sun and draw foot traffic to nearby business based on their aesthetically pleasing nature.

The boxes are typically installed on the street side of sidewalks, with long, narrow storage volumes below the pavement. Runoff is eliminated through a combination of trees taking up water (and nutrients), percolating into the ground and discharging to stormwater systems. Pollutants are removed as they pass through the soil media in the “box” and as trees absorb and filter pollutants.

#### Pervious pavement

Permeable pavement, which can be composed of pervious concrete, porous asphalt or interlocking pavers, quickly percolate rainwater where it falls as well as runoff from adjacent areas, allowing it to slowly soak into ground.

Parking lots, which make up a substantial portion of developed land areas, can be retrofitted or built with pervious surfaces from the start to significantly reduce runoff volumes.

Pervious pavement can be constructed to be similar in appearance to conventional asphalt surfacing, while pavers can be used to create intricate pavement designs. The implementation of pervious pavement of all types is often particularly cost-effective in places with high land values and recurrent nuisance flooding.