

**-EPA ICR No. 1365.12; OMB Control No. 2070-0091**

**Attachment E**

**Worksheet A-1: Annual Recordkeeping Burden, by School Type and Asbestos Type**

**Worksheet A-2: Annual Recordkeeping Cost, by School Type and Asbestos Type.**

The worksheets A-1 and A-2 have been revised from the previous ICR renewal supporting materials. The number schools with Friable ACM (SM & TSI and TSI) were recalculated starting from the year 1 of the program. It was assumed that number of schools with Friable material follow a decay exponential function with a rate of decay equal of 6%. In addition, it was considered that the life span of school buildings is 85 years old. Therefore, the number of schools with friable ACM approaches asymptotically to zero when the AHERA program approaches year 85<sup>1</sup>. Consistent with previous ICR renewals supporting materials the numbers of public primary and secondary schools, and private schools from the Dept. of Education’s National Center for Education Statistics (NCES) were used to estimate the number of schools with non-friable (NFACM). NCES data for 20013-2014 (the latest available data) were used for the current ICR renewal. The number of schools with NFACM includes schools from the 1984 survey that have moved from friable to non-friable ACM category but also includes new school buildings. As result the burden for schools in the NFACM may be overestimated. Tables A1-A4 shows the data used on worksheets A1 and A2.

### Worksheet A-1: Annual Recordkeeping Burden, by School Type and Asbestos Type

Worksheet A-1. Annual Recordkeeping Burden, by School Type and Asbestos Type											
Year	ACM Type	Previous Year Removals	School Counts	Public Primary		Public Secondary		Private		Total Hours	Annual Total Hours
				No. of Schools	Hours/School	No. of Schools	Hours/School	No. of Schools	Hours/School		
32	SM & TSI		5,280	2503	35	1,497	58	1,279	35	219,196	2,594,670
	TSI	-	1,660	799	35	464	58	397	35	68772	
	NFACM		123,990	70,384	15	28,199	28	30,758	15	230,6702	
33	SM & TSI	308	4,972	2,358	35	1,410	58	1204	35	206,450	2,585,855
	TSI	96	1,564	752	35	437	58	374	35	64,756	
	NFACM		124,394	70,576	15	28,313	28	30,883	15	231,4649	
34	SM&TSI	290	4,682	2,220	35	1,328	58	1,134	35	194,414	2,577,155
	TSI	91	1,473	708	35	411	58	353	35	60,973	
	NFACM		124,775	70,758	15	28,421	28	30,974	15	2,321,768	
Total Hours for Years 32 – 34										7,757,680	
Average Hours Per Year for Years 32 – 34										2,585,893	
SM = surfacing material; TSI = thermal systems insulation. Both are friable ACM. NFACM = nonfriable ACM. Sources: AHERA RIA (EPA, 1987c), Table 4 and Appendix G, Tables 6a and 6b Appendix J; Addendum to ICR #2070-0091 Asbestos in Schools Rule (EPA, 1987a) (1) On year 30 Friable and non-Friable ACM will have been removed from the 106,984 schools surveyed according to the AHERA RIA (EPA, 1987c).											

### Worksheet A-2: Annual Recordkeeping Cost, by School Type and Asbestos Type

<sup>1</sup> Exponential Decay Function:

$$y(t) = A e^{-kt}$$

Where  $k = 0.03$  is the rate of decay, and  $t = 1, \dots, 85$  and A is the number of schools with Friable ACM on year 1 of the AHERA program.

Worksheet A-2: Annual Recordkeeping Cost, by School Type and Asbestos Type <sup>2</sup>										
Year	ACM Type	School Counts	Public Primary		Public Secondary		Private		Total Cost (\$)	Annual Total Cost (\$)
			No. of Schools	\$ per School	No. of Schools	\$ per School	No. of Schools	\$ per School		
32	SM & TSI	5,280	2503	\$1,379	1,497	\$2,142	1,279	\$1,379	\$8,421,952	\$105,771,541
	TSI	1,660	799	\$1,379	464	\$2,142	397	\$1,379	\$2,643,172	
	NFACM	123,990	70,384	\$640	28,199	\$1,063	30,758	\$640	\$94,706,417	
33	SM & TSI	4,972	2,358	\$1,379	1,410	\$2,142	1204	\$1,379	\$7,932,218	\$105,451,505
	TSI	1,564	752	\$1,379	437	\$2,142	374	\$1,379	\$2,488,808	
	NFACM	124,394	70,576	\$640	28,313	\$1,063	30,883	\$640	\$95,030,479	
34	SM&TSI	4,682	2,220	\$1,379	1,328	\$2,142	1,134	\$1,379	\$7,469,742	\$105,133,226
	TSI	1,473	708	\$1,379	411	\$2,142	353	\$1,379	\$2,343,481	
	NFACM	124,775	70,758	\$640	28,421	\$1,063	30,974	\$640	\$95,320,003	
Total Cost for Years 32-34									\$316,356,272	
Average Cost per Year for Years 32-34									\$105,452,091	
SM = surfacing material; TSI = thermal systems insulation. Both are friable ACM. NFACM = non-friable ACM.										
Sources: AHERA RIA (EPA, 1987c), Table 4, Appendix G and J; Addendum to ICR #2070-0091, Asbestos in Schools Rule (EPA, 1987a)										
Wage rates have been updated as described in the text.										

Table A-1: Number of Schools with Friable ACM (SM&TSI)

Number of Schools with SM&TSI

Year	Public Primary	Public secondary	Private Private	Total
1	16082	9617	8216	33915
2	15145	9057	7737	31940
3	14263	8529	7287	30080
4	13433	8033	6863	28328
5	12650	7565	6463	26678
6	11914	7124	6086	25125
7	11220	6710	5732	23662
8	10567	6319	5398	22284
9	9951	5951	5084	20986
10	9372	5604	4788	19764
11	8826	5278	4509	18613
12	8312	4970	4246	17529
13	7828	4681	3999	16508

<sup>2</sup>Totals may not match totals in Section 6 worksheets due to rounding.

14	7372	4408	3766	15547
15	6943	4152	3547	14641
16	6538	3910	3340	13789
17	6158	3682	3146	12986
18	5799	3468	2962	12229
19	5461	3266	2790	11517
20	5143	3076	2628	10847
21	4844	2897	2475	10215
22	4562	2728	2331	9620
23	4296	2569	2195	9060
24	4046	2419	2067	8532
25	3810	2278	1946	8035
26	3588	2146	1833	7567
27	3379	2021	1726	7127
28	3182	1903	1626	6712
29	2997	1792	1531	6321
30	2823	1688	1442	5953
31	2658	1590	1358	5606
32	2503	1497	1279	5280
33	2358	1410	1204	4972
34	2220	1328	1134	4682
35	2091	1250	1068	4410
36	1969	1178	1006	4153
37	1855	1109	947	3911
38	1747	1044	892	3683
39	1645	983	840	3469
40	1549	926	791	3267
41	1459	872	745	3077
42	1374	822	702	2897
43	1294	774	661	2729
44	1218	729	622	2570
45	1148	686	586	2420
46	1081	646	552	2279
47	1018	609	520	2146
48	958	573	490	2021
49	903	540	461	1904
50	850	508	434	1793
51	801	479	409	1688
52	754	451	385	1590
53	710	425	363	1497
54	669	400	342	1410
55	630	377	322	1328
56	593	355	303	1251
57	559	334	285	1178
58	526	314	269	1109

59	495	296	253	1045
60	466	279	238	984
61	439	263	224	927
62	414	247	211	873
63	390	233	199	822
64	367	219	187	774
65	345	207	176	729
66	325	195	166	686
67	306	183	157	646
68	289	173	147	609
69	272	162	139	573
70	256	153	131	540
71	241	144	123	508
72	227	136	116	479
73	214	128	109	451
74	201	120	103	425
75	190	113	97	400
76	179	107	91	377
77	168	101	86	355
78	158	95	81	334
79	149	89	76	315
80	140	84	72	296
81	132	79	68	279
82	125	74	64	263
83	117	70	60	247
84	110	66	56	233
85	104	62	53	219

Graph A-1: Number of Schools with Friable ACM (SM&TSI)

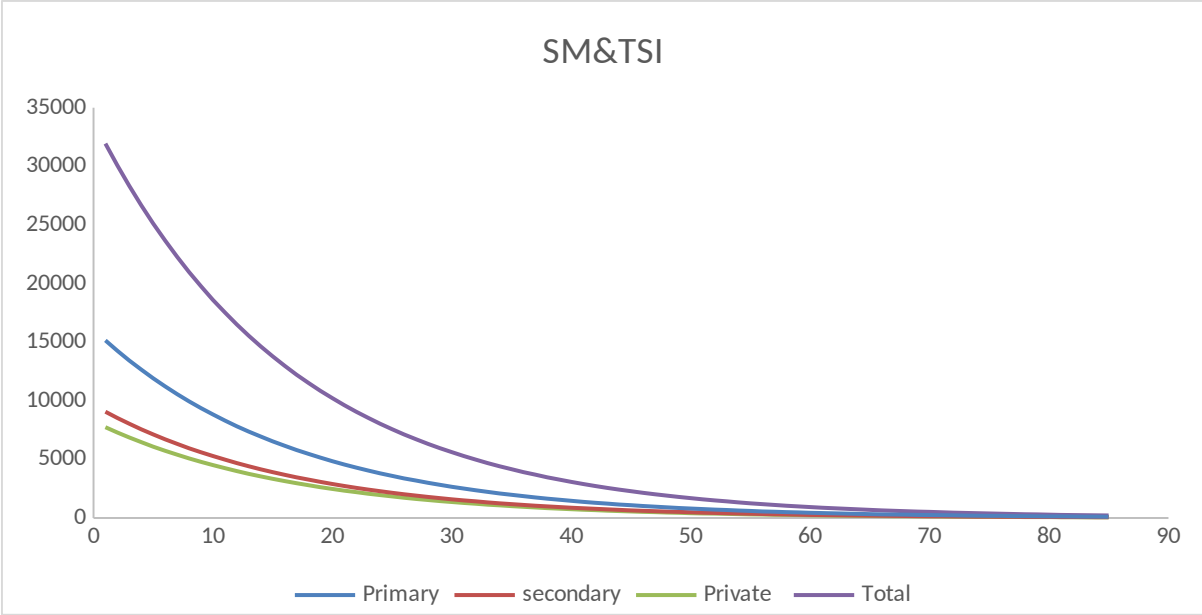


Table A-2: Number of Schools with Friable ACM (TSI)

Number of schools with TSI				
Year	primary	secondary	private	Total
1	5132	2891	2554	10667
2	4833	2807	2405	10046
3	4551	2643	2265	9461
4	4287	2490	2133	8910
5	4037	2345	2009	8391
6	3802	2208	1892	7902
7	3580	2079	1782	7442
8	3372	1959	1678	7009
9	3175	1844	1580	6600
10	2991	1737	1488	6216
11	2816	1636	1402	5854
12	2652	1541	1320	5513
13	2498	1451	1243	5192
14	2352	1366	1171	4889
15	2215	1287	1102	4605
16	2086	1212	1038	4337
17	1965	1141	978	4084
18	1850	1075	921	3846
19	1743	1012	867	3622
20	1641	953	817	3411
21	1546	898	769	3213
22	1456	845	724	3026

23	1371	796	682	2849
24	1291	750	642	2683
25	1216	706	605	2527
26	1145	665	570	2380
27	1078	626	537	2241
28	1016	590	505	2111
29	956	555	476	1988
30	901	523	448	1872
31	848	493	422	1763
32	799	464	397	1660
33	752	437	374	1564
34	708	411	353	1473
35	667	388	332	1387
36	628	365	313	1306
37	592	344	294	1230
38	557	324	277	1158
39	525	305	261	1091
40	494	287	246	1027
41	465	270	232	968
42	438	255	218	911
43	413	240	205	858
44	389	226	193	808
45	366	213	182	761
46	345	200	172	717
47	325	189	161	675
48	306	178	152	636
49	288	167	143	599
50	271	157	135	564
51	255	148	127	531
52	241	140	120	500
53	227	132	113	471
54	213	124	106	443
55	201	117	100.	418
56	189	110	94	393
57	178	103	89	370
58	168	97	83	349
59	158	92	79	329
60	149	86	74	309
61	140	81	69.	291
62	132	77	66	274
63	124	72	62	258
64	117	68	58	243
65	110	64	55	229
66	104	60	52	216
67	98	57	49	203
68	92	53	46	191
69	87	50	43	180
70	82	47	41	170
71	77	45	38	160

Year	primary	secondary	private	Total
72	72	42	36	151
73	68	40	34	142
74	64	37	31	134
75	61	35	30	126
76	57	33	28	118
Number of schools with NFACM	54	31	27	111
78	50	29	25	105
79	29	48	27	104
80	30	45	28	103
81	31	42	28	101
82	40	23	20	83
83	37	21	19	78
84	35	20	17	73
85	33	19	16	69

Graph A-2: Number of Schools with Friable ACM (TSI)

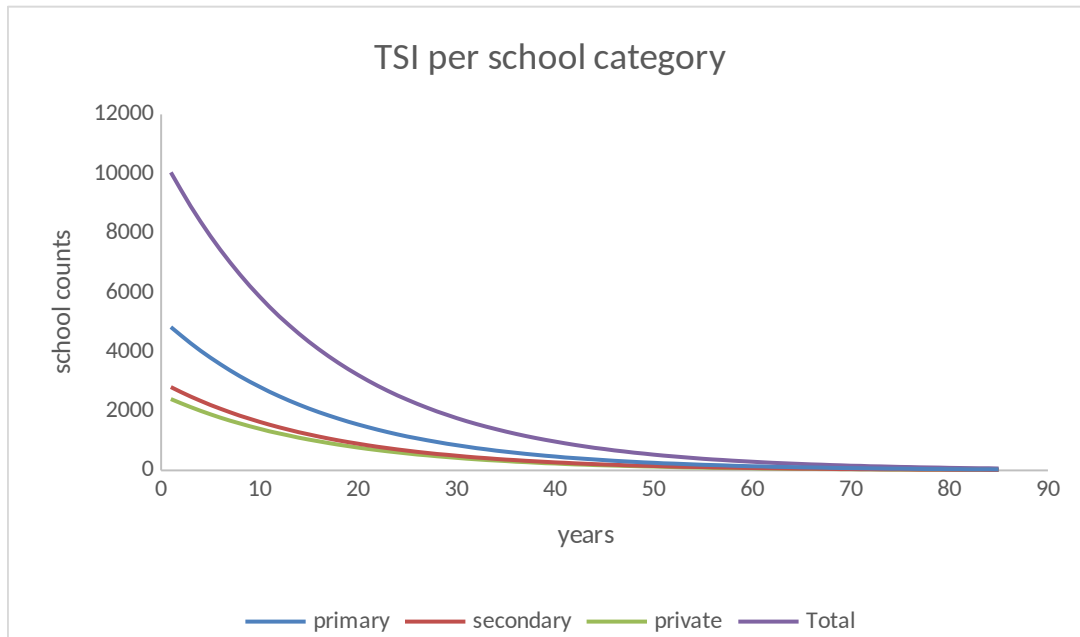


Table A-3: Number of Schools with Non-Friable ACM (NFACM)



Table A-4: Estimated Life Spam of Public Schools.

**Estimated Lifespan of Public Schools**

	Midpoint	Age in 1996	Percent
Before 1950	---	---	28%
1950 - 1969	1964	32	45%
1970 - 1984	1977	19	17%
1985 - 1996	1991	5.5	10%

Mean age 42

Source: "How Old Are America's Public Schools?", NCES 1999-048, National Center for Education Statistics, U.S. Dept. of Education, January 1999. based on data from National Center on Education Statistics, "Survey on Advanced Telecommunications in U.S. Public Schools, Fall 1996", FRSS 61, 1996.

Average age of pre-1950 schools	85	years old
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Labor Category	Data Source for Wage Information	Wage (\$/hour)	Fringes as % wage <sup>b</sup>	Fringe Benefit	Total Compensation	Overhead as % total compensation <sup>c</sup>	Overhead	Loaded Wage (\$/hr)
		(a)	(b)	(c) = (a)*(b)	(d) = (a)+(c)	(e)	(f) = (d)*(e)	(g) = (d)+(f)
EPA staff	Annual federal	\$55.75	63.90%	\$35.62	\$91.37	20%	\$18.27	\$109.65

	staff cost: OPM Washington- Baltimore- Northern Virginia, DC- MD-PA-VA- WV area,_GS-13 Step 5 pay rates <sup>a</sup>							
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Footnotes:

a Source: U.S. Office of Personnel Management. (2020). Salary Table 2020-DCB. Retrieved June 17, 2020 from Pay & Leave: Salaries & Wages: [https://www.opm.gov/policy-data-oversight/pay-leave/salaries-wages/salary-tables/20Tables/html/DCB\\_h.aspx](https://www.opm.gov/policy-data-oversight/pay-leave/salaries-wages/salary-tables/20Tables/html/DCB_h.aspx).

b Source: Falk, J. 2012. "Comparing Benefits and Total Compensation in the Federal Government and the Private Sector." Congressional Budget Office Working Paper Series.

<https://www.cbo.gov/sites/default/files/112th-congress-2011-2012/workingpaper/2012-04fedbenefitswp0.pdf>

<sup>c</sup> An overhead rate of 20% is used based on assumptions in *Handbook on Valuing Changes in Time Use Induced by Regulatory Requirements and Other U.S. EPA Actions* (EPA 2020).