



MISSISSIPPI STATE
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FOREST AND WILDLIFE RESEARCH CENTER

DEPARTMENT of Sustainable Bioproducts
(Formerly Department of Forest Products)

Seventh Annual Evaluation of MSU/RTA Alternative Preservative Study

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This report covers the seventh annual evaluation of the full length crossties exposed as part of the MSU/RTA alternative preservative study. A visual evaluation of the exposed top surface was conducted for all ties at both exposure sites.

General Observations:

No unexpected results were found. Checks and/or splits were noted to be worse at Site 2 probably due to more direct sunlight exposure. Termite activity was not intensive as expected at this site which again may be due to the sunlight exposure. However, the decay at this site was active. Ties at Site 1 were more moist/wet due to the increased rain fall, shade and leaf litter as well as the clay soil at this site and these ties showed an increased amount of decay in the controls and more vigorous termite (*Reticulitermes flavipes*) activity due to these conditions.

A few photographs documenting the condition of the sites and some of the noted deterioration can be seen below (Figures 1 - 8). The tie number denotes the position of exposure as recorded on the plot-maps. Copies of the inspection forms can be found in the appendix.



Figure 1 - An overall view of exposure Site 2 illustrating the conditions at the time of inspection.



Figure 2 - A general photograph of Site 1 at the time of inspection.

Site 1 - Dorman Lake Test Site



Figure 3 - Tie #4 (white oak/control) showing severe decay damage.



Figure 4 - Tie #4 bottom surface (white oak/control) with heavy decay.

Site 2 – Formosan Termite Research Facility



Figure 5 - Tie #9 (Turada) with decay.



Figure 6 - Tie #209 with decay and termites present (*Reticulitermes*).



Figure 7 – Tie #83 with extensive decay.



Figure 8 – Tie #223 with “iron sickness”.

APPENDIX:

Plot Map RTA Ties (Dorman - installed 4-08)

Position Row 1 runs North - South (Eastern most row)

			May-15				
			Decay	Termite	Decay	Termite	Comments
1	wo-2	Cedar	x	x	x	x	Cut 5/10
2	wo-3		x	x	x	x	Cut 5/12
3	wo-4		x	x	x	x	Cut 5/14
4	wo-5		7	8			split
5	wo-7		9	10			check
6	wo-6		8	10			
7	wo-1		8	10			
8	wo-10		8	10			check
9	wo-8		9	10			
10	wo-9		8	10			
11	wo-21		8	9			live termites/DK top&bottom
12	ro-18		x	x	x	x	Cut 5/10
13	ro-19		x	x	x	x	Cut 5/12
14	ro-20		10	10			
15	ro-7		10	10			
16	ro-6		9	10			check
17	ro-5		8	10			alligator
18	ro-21		9	10			
19	ro-4		8	10			check
20	ro-3		10	10			check
21	ro-2		8	10			check
22	ro-1		x	x	x	x	Cut 5/14
23	5	Turada	x	x	x	x	Cut 5/10
24	6		10	10			
25	7		10	10			
26	4		10	10			
27	2		x	x	x	x	Cut 5/14
28	9		10	10			
29	8		9.5	10			edge
30	10		10	10			
31	1		10	10			
32	3		x	x	x	x	Cut 5/12
33	SROBC-7	Seaman	x	x	x	x	Cut 5/10
34	SROBC-7		x	x	x	x	Cut 5/12
35	SROBC-7		10	10			
36	SROBC-7		10	10			
37	SROBC-7		10	10			
38	SROBC-7		10	10			check
39	SROBC-7		x	x	x	x	Cut 5/14
40	SROBC-5		x	x	x	x	Cut 5/10
41	SROBC-7		10	10			
42	SWOCEF		x	x	x	x	Cut 5/10
43	SWOCEF		x	x	x	x	Cut 5/12
44	SWOCEF		10	10			
45	SWOCEF		10	10			

46	SWOCEF		10	10				
47	SWOCEF		10	10				
48	SWOCEF		10	10				
49	SWOCEF		10	10				
50	SWOCEF		x	x	x	x	Cut 5/14	
51	SROC-7		x	x	x	x	Cut 5/10	
52	SWOC-5		x	x	x	x	Cut 5/10	
53	SROBC-5		7	9				
54	SWOBCREF		x	x	x	x	Cut 5/10	
55	SWOBCREF		x	x	x	x	Cut 5/14	
56	SWOBCREF		10	10				
57	SWOBCREF		10	10			check	
58	SWOBCREF		10	10				
59	SWOBCREF		10	10				
60	SWOBCREF		10	10				
61	SWOBCREF		x	x	x	x	Cut 5/12	
62	SROC5		x	x	x	x	Cut 5/10	
63	SROC5		x	x	x	x	Cut 5/12	
64	SROC5		10	10				
65	SROC5		10	10				
66	SROC5		10	10				
67	SROC5		10	10				
68	SROC5		10	10				
69	SROC5		10	10				
70	SROC5		x	x	x	x	Cut 5/14	
71	SROBC5		x	x	x	x	Cut 5/12	
72	SROBC5		10	10				
73	SROBC5		10	10				
74	SROBC5		10	10				
75	SWOBCREF		10	10				
76	SWOCREF		10	10				
77	SROC5		10	10				
78	SROBC5		10	10			check	
79	SROBC5		10	10				
80	SROBC5		10	10			check	
81	SROBC5		10	10				
82	SWOBCREF		10	10				
83	SROBC5		10	10				
84	SROBC5		x	x	x	x	Cut 5/14	
85	wo-136	Lonza	x	x	x	x	Cut 5/10	
86	wo-130		x	x	x	x	Cut 5/12	
87	wo-129		x	x	x	x	Cut 5/14	
88	wo-121		10	10				
89	wo-127		9.5	10				
90	wo-124		10	10				
91	wo-128		10	10				
92	wo-122		10	10				
93	wo-123		10	10				
94	wo-125		10	10				

95	ro-105	x	x	x	x	Cut 5/10
96	ro-104	x	x	x	x	Cut 5/12
97	ro-103	x	x	x	x	Cut 5/14
98	ro-102	10	10			
99	ro-110	10	10			
100	ro-107	10	10			
101	ro-106	10	10			
102	ro-109	10	10			
103	ro-101	10	10			
104	ro-108	10	10			
105	wo-135	x	x	x	x	Cut 5/10
106	wo-134	x	x	x	x	Cut 5/12
107	wo-138	10	10			
108	wo-139	10	10			
109	wo-137	10	10			
110	wo-132	10	10			
111	wo-136	9	10			
112	wo-140	10	10			
113	wo-133	x	x	x	x	Cut 5/14
114	wo-131	9	10			
115	ro-182	0	0	0	0	FAILED
116	wo-181	8	10			
117	ro-114	x	x	x	x	Cut 5/10
118	ro-120	10	10			
119	ro-117	x	x	x	x	Cut 5/12
120	ro-112	10	10			
121	ro-113	10	10			
122	ro-115	10	10			check
123	ro-119	10	10			
124	ro-116	10	10			
125	ro-111	10	10			
126	ro-118	x	x	x	x	Cut 5/14
127	P3RO7-39	KMG	10	10		
128	P3RO7-36		10	10		
129	P3RO7-37		10	10		
130	P3RO7-38		10	10		
131	P3RO7-23		10	10		
132	P3RO7-40		10	10		
133	P3RO7-26		10	10		
134	P3RO7-42	x	x	x	x	Cut 5/14
135	P3RO7-35	x	x	x	x	Cut 5/12
136	P3RO7-41	x	x	x	x	Cut 5/10
137	P3WO7-5	x	x	x	x	Cut 5/10
138	P3WO7-4	x	x	x	x	Cut 5/12
139	P3WO7-6	x	x	x	x	Cut 5/14
140	P3WO7-7	10	10			
141	P3WO7-11	10	10			
142	P3WO7-17	10	10			
143	P3WO7-20	10	10			

144	P3WO7-2		10	10				
145	P3WO7-8		10	10				
146	P3WO7-3		10	10				
147	Woctrl-21		8	9				live termites/check
148	Roctrl-43		8	9				check
149	WO122	Nisus	x	x	x	x		Cut 5/14
150	WO14		10	10				
151	WO128		10	10				check
152	WO61		10	10				check
153	WO5		10	10				
154	WO1		10	10				check
155	WO71		10	10				check
156	WO98		10	10				
157	WO139		x	x	x	x		Cut 5/14
158	WO135		10	10				check
159	WO144		10	10				
160	WO126		10	10				check
161	WO131		10	10				check
162	WO138		10	10				split
163	WO130		10	10				check
164	WO125		x	x	x	x		Cut 5/12
165	WO29		x	x	x	x		Cut 5/12
166	WO52		x	x	x	x		Cut 5/10
167	WO137		10	10				
168	WO134		x	x	x	x		Cut 5/10
169	WO44ctrl		x	x	x	x		Cut 5/14
170	WO94ctrl		x	x	x	x		Cut 5/12
171	RO6ctrl		x	x	x	x		Cut 5/12

172	RO-51ctrl	x	x	x	x	Cut 5/14
173	RO21	x	x	x	x	Cut 5/14
174	RO22	10	10			
175	RO15	10	10			check
176	RO62	10	10			
177	RO46	10	10			
178	RO2	10	10			
179	RO24	x	x	x	x	Cut 5/12
180	RO20	x	x	x	x	Cut 5/10
181	RO37	x	x	x	x	Cut 5/10
182	RO31	10	10			
183	RO59	x	x	x	x	Cut 5/14
184	RO89	10	10			
185	RO13	10	10			
186	RO58	10	10			
187	RO57	10	10			
188	RO12	10	10			check
189	RO56	10	10			
190	RO25	10	10			
191	RO43	10	10			check
192	RO10	x	x	x	x	Cut 5/12
193	RO54	x	x	x	x	Cut 5/10
194	RO38	x	x	x	x	Cut 5/12
195	RO45	x	x	x	x	Cut 5/14
196	RO16	10	10			
197	RO72	9.5	10			
198	RO77	9.5	9.5			
199	RO40	10	10			
200	RO55	10	10			
201	RO18	10	10			
202	RO3	10	10			
203	WO49	x	x	x	x	Cut 5/10
204	WO121	x	x	x	x	Cut 5/12
205	WO68	x	x	x	x	Cut 5/14
206	WO11	9.5	10			
207	WO65	9	10			
208	WO92	9.5	10			
209	WO60	8	10			
210	WO47	9.5	10			
211	WO90	9.5	10			
212	WO69	9	10			
213	MRO8	Merichem	x	x	x	Cut 5/10
214	MRO8		x	x	x	Cut 5/14
215	MROB8		x	x	x	Cut 5/10
216	MROB8		10	10		
217	MROB8		10	10		
218	MROB8		10	10		
219	MROB8		10	10		check
220	MROB8		10	10		

221	MROB8	9	10			
222	MROB8	x	x	x	x	Cut 5/14
223	MROB8	x	x	x	x	Cut 5/12
224	MWO8ctrl	7	10			
225	MWO8ctrl	7	10			
226	MRO8ctrl	0	0	0	0	FAILED
227	MRO8	x	x	x	x	Cut 5/12
228	MRO8	10	10			
229	MRO8	10	10			
230	MRO8	10	10			
231	MRO8	10	10			
232	MRO8	10	10			
233	MRO8	10	10			
234	MRO8	10	10			
235	MWOB8	x	x	x	x	Cut 5/10
236	MWOB8	x	x	x	x	Cut 5/14
237	MWOB8	10	10			
238	MWOB8	10	10			
239	MWOB8	10	10			
240	MWOB8	10	10			
241	MWOB8	10	10			
242	MWOB8	10	10			
243	MWOB8	10	10			
244	MWOB8	x	x	x	x	Cut 5/12

Row 2 runs North - South (May-15

		Decay	Termite	Decay	Termite	Comments
245	6	x	x	x	x	Cut 5/10
246	14	x	x	x	x	Cut 5/14
247	79	10	10			
248	73	x	x	x	x	Cut 5/12
249	75	x	x	x	x	Cut 5/14
250	?	10	10			
251	80	10	10			
252	?	10	10			
253	62	10	10			
254	82	10	10			
255	68	10	10			
256	74	10	10			
257	37	x	x	x	x	Cut 5/10
258	26	x	x	x	x	Cut 5/14
259	53	x	x	x	x	Cut 5/10
260	59	x	x	x	x	Cut 5/14
261	52	10	10			
262	48	10	10			
263	45	10	10			
264	67	x	x	x	x	Cut 5/10
265	51?	10	10			

266	?		10	10			
267	88		10	10			
268	46		x	x	x	x	Cut 5/12
269	12		10	10			check
270	20		x	x	x	x	Cut 5/12
271	31		x	x	x	x	Cut 5/12
272	17		10	10			
273	4		10	10			
274	10?		10	10			
275	16		10	10			
276	5		10	10			
277	27		10	10			
278	36		10	10			
279	24		10	10			
280	?		10	10			
281	22		10	10			
282	39		10	10			
283	25		10	10			
284	?		10	10			
285	WO30	Enviro	x	x	x	x	Cut 5/10
286	RO6		x	x	x	x	Cut 5/10
287	RO7		10	10			
288	RO8		10	10			
289	RO9		9	9.5			
290	RO1		x	x	x	x	Cut 5/14
291	RO2		10	10			
292	RO3		9.5	10			check
293	RO4		10	10			
294	RO5		9.5	10			
295	RO10		x	x	x	x	Cut 5/12
296	6	BioP					
297	1						
298	7						
299	8						
300	9						
301	10						
302	2						
303	3						
304	4						
305	5						
306	12						control?
307	9469						
308	9459						
309	9460						
310	9471						
311	9472						
312	9470						
313	9464						
314	11						control?

315	9468							
316	9466							
317	9467							
318	roctrl	Enviro	0	0	0	0	FAILED	
319	roctrl		6	9				
320	woctrl		7	10				
321	woctrl		6	9			fruiting body	
322	WO22		x	x	x	x	Cut 5/14	
323	WO23		9.5	10				
324	WO24		9.5	10				
325	W025		9.5	10				
326	WO27		9.5	10				
327	WO28		10	10				
328	WO29		9.5	10				
329	WO21		9.5	10				
330	WO26		x	x	x	x	Cut 5/12	
331	MWO8	Meri	x	x	x	x	Cut 5/12	
332	MWO8		10	10				
333	MWO8		10	10			check	
334	MWO8		10	10				
335	MWO8		10	10				
336	MWO8		10	10				
337	MWO8		10	10				
338	MWO8		10	10				
339	MWO8		10	10				
340	MWO8		x	x	x	x	Cut 5/14	
341	MWO8		x	x	x	x	Cut 5/10/heart rot	

Plot Map RTA Ties (McNeill)

Position Row 1 runs East - West (Northern most row)

March-15

			Decay	Termite	Decay	Termite	Comments
Turada	1	1	x	x	x	x	cut 4/10
	2	2	10	10			
	3	3	10	10			
	4	4	10	10			large check
	5	5	10	10			
	6	6	10	10			
	7	7	10	10			
	8	8	x	x	x	x	cut 4/14
	9	9	8	10			Dk on top
	10	10	x	x	x	x	cut 5/12
Envirosafe	11	11RO	x	x	x	x	cut 5/12
	12	15RO	10	10			large check
	13	14RO	10	10			large check
	14	13RO	10	10			large check
	15	12RO	10	10			large check
	16	20RO	10	10			
	17	19RO	10	10			large check
	18	18RO	10	10			large check
	19	17RO	x	x	x	x	cut 4/14
	20	16RO	x	x	x	x	large check/cut 4/10
	21	35WO	x	x	x	x	cut 4/10
	22	34WO	x	x	x	x	cut 4/14
	23	33WO	10	10			large check
	24	32WO	10	10			large check
	25	31WO	10	10			large check
	26	40WO	10	10			large check
	27	39WO	10	10			large check
	28	38WO	10	10			
	29	37WO	10	10			large check
	30	36WO	x	x	x	x	cut 5/12
Seaman	31	SROC5	x	x	x	x	cut 4/10
	32	SROC5	x	x	x	x	cut 4/14
	33	SROC5	10	10			large check
	34	SROC5	10	10			pic 09/large check
	35	SROC5	10	10			large check
	36	SROC5	10	10			
	37	SROC5	10	10			
	38	SROC5	10	10			
	39	SROC5	10	10			large check
	40	SROC5	x	x	x	x	cut 5/12
	41	SROBC5	x	x	x	x	split/cut 4/10
	42	SROBC5	x	x	x	x	cut 4/14
	43	SROBC5	10	10			
	44	SROBC5	10	10			
	45	SROBC5	10	10			large check
	46	SROBC5	10	10			
	47	SROBC5	10	10			
	48	SROBC5	10	10			

49	SROBC5		10		10					
50	SROBC5	x		x		x	x	cut 5/12		
51	SWOCREF	x		x		x	x	cut 4/10		
52	SWOCREF	x		x		x	x	cut 4/14		
53	SWOCREF		10		10					
54	SWOCREF		10		10			large check		
55	SWOCREF		10		10					
56	SWOCREF		10		10					
57	SWOCREF		10		10					
58	SWOCREF		10		10					
59	SWOCREF		10		10			large check		
60	SWOCREF	x		x		x	x	cut 5/12		
61	SWOBCREF	x		x		x	x	cut 4/10		
62	SWOBCREF	x		x		x	x	cut 4/14		
63	SWOBCREF		10		10			large check		
64	SWOBCREF		10		10					
65	SWOBCREF		10		10			large check		
66	SWOBCREF		10		10					
67	SWOBCREF		10		10			large check		
68	SWOBCREF		10		10			large check		
69	SWOBCREF		10		10			large check		
70	SWOBCREF	x		x		x	x	cut 5/12		
71	SROBC7	x		x		x	x	cut 4/10		
72	SROBC7	x		x		x	x	cut 4/14		
73	SROBC7		10		10					
74	SROBC7		10		10					
75	SROBC7		10		10			large check		
76	SROBC7		10		10					
77	SROBC7		10		10			large check		
78	SROBC7		10		10					
79	SROBC7		10		10			large check		
80	SROBC7	x		x		x	x	cut 5/12		
81	ctrlSROC7	x		x		x	x	cut 4/10		
82	ctrlSWOC5	x		x		x	x	cut 4/10		
83	ctrlSWOC5			6		9		pic 09/active DK/FB		
Lonza	84	209	x		x		x	x	cut 4/10	
	85	206		10		10			large check	
	86	204		10		10			large check	
	87	201	x		x		x	x	cut 4/14	
	88	208		10		10			large check	
	89	203		10		10				
	90	205		10		10			large check	
	91	207		10		10				
	92	210		8		10			large check	
	93	202	x		x		x	x	cut 5/12	
Nisus	94	240	x		x		x	x	cut 4/10	
	95	237	x		x		x	x	cut 5/12	
	96	243	x		x		x	x	cut 4/14	
	97	238		10		10			large check	
	98	245		10		10			large check	
	99	239		10		10			large check	
	100	247		10		10			large check	

101	241		10	10			
102	233		10	10			large check
103	242		10	10			large check
104	203	x		x	x	x	cut 4/10
105	227	x		x	x	x	cut 5/12
106	207	x		x	x	x	cut 4/14
107	200		10	10			large check
108	229		10	10			
109	206		10	10			large check
110	216		10	10			large check
111	220		10	10			
112	212		10	10			large check
113	222		10	10			
114	217	x		x	x	x	cut 4/10
115	264		10	10			large check
116	287		10	10			large check
117	253		10	10			large check
118	283		10	10			large check
119	219	x		x	x	x	cut 5/12
120	276		10	10			large check
121	292		10	10			
122	269		10	10			large check
123	289	x		x	x	x	cut 4/14
124	225	x		x	x	x	cut 4/10
125	204	x		x	x	x	cut 5/12
126	234	x		x	x	x	cut 4/14
127	215		10	10			large check
128	231		10	10			large check
129	213		10	10			
130	205		10	10			large check
131	208		10	10			large check
132	210		8	10			split
133	226		10	10			
134	305	x		x	x	x	cut 4/10
135	201		10	10			large check
136	313	x		x	x	x	cut 4/14
137	294		10	10			
138	308		10	10			large check
139	301		10	10			
140	291		10	10			large check
141	309		10	10			large check
142	296		10	10			
143	314		10	10			
Lonza	144	236	x		x	x	cut 5/12
	145	232	x		x	x	cut 4/14
	146	238		10	10		
	147	234		10	10		
	148	231		10	10		large check
	149	233		10	10		large check
	150	235		10	10		large check
	151	239		10	10		
	152	240		10	10		

Nisus	153	237	x	x	x	x	cut 4/10	_____
	154	272	x	x	x	x	cut 4/10	_____
	155	223	x	x	x	x	cut 4/14	_____
	156	256	x	x	x	x	cut 5/12	_____
	157	297		10	10			_____
	158	295		10	10		split	_____
	159	267		10	10		split	_____
	160	299		10	10			_____
	161	261		10	10			_____
	162	214		10	10			_____
Lonza	163	275		10	10			_____
	164	281		8	10		fruiting body	_____
Nisus	165	282		4	10		fruiting body/loose plate	_____
	166	315		9	10		large check	_____
	167	316	x	x	x	x	cut 4/14	_____
	168	249		4	10			_____
	169	248	x	x	x	x	cut 4/14	_____

Row 2 runs East - West (middle row)

March-15

			Decay	Termite	Decay	Termite	Comments	
Lonza	170	220	x	x	x	x	cut 4/10	
	171	218	x	x	x	x	cut 4/14	
	172	214		10			large check	
	173	219		10				
	174	212		10				
	175	217		10			large check	
	176	216		10			large check	
	177	211		10				
	178	213		9.5		10	large check	
	179	215	x		x		cut 5/12	
	180	224	x		x		cut 4/10	
	181	228		10		10	large check	
	182	221		10		10	large check	
	183	222		10		10		
	184	230		10		10	large check	
	185	225		10		10	large check	
	186	226		10		10	large check	
	187	229		10		10	large check	
	188	223	x		x		cut 4/14	
	189	227	x		x		cut 5/12	
	Cedarcide	190	19W	x	x	x	x	cut 4/10
		191	20W	x	x	x	x	cut 4/14
		192	15W		10		10	split
193		16WC		10		10	large check	
194		18W		10		10	split	
195		17W		8		10	shake	
196		10R	x		x		cut 4/10	
197		9RC		10		10	large check	
198		8R	x		x		cut 5/12	
199		11W	x		x		cut 5/12	
200		12W		10		10	split	
201		13W		10		10	split	
202		14W		10		10	split	
203		11R	x		x		cut 4/14	
204		12R		10		10	split	
205		13R		9		10	split	
206		14R		10		10		
207		15R		10		10	split	
208		16R		9		10	alligator	
209		17R		8		10	alligator	
210	22R		4		9	large check/retics		
211	22W		10		10	split		
Merichem	212	MWOB8	x		x		cut 4/10	
	213	MWOB8	x		x		cut 4/14	
	214	MWOB8		10		10	large check	
	215	MWOB8		10		10		
	216	MWOB8		10		10	large check	
	217	MWOB8		10		10	large check	

	218	MWOB8	x		x	x	x	cut 5/12
	219	MRO8	x		x	x	x	cut 5/12
	220	MRO8	x		x	x	x	cut 4/10
	221	MRO8	x		x	x	x	cut 4/14
	222	MRO8		10	10			pic 09
	223	MRO8		9.5	10			large check/iron sickness
	224	MRO8		10	10			
	225	MRO8		10	10			large check
	226	MRO8		10	10			split
	227	MWOB8		10	10			
	228	MWOB8		10	10			large check
	229	MRO8		10	10			
	230	MRO8		10	10			large check
	231	MRO8		10	10			
	232	MWO8	x		x	x	x	cut 4/10
	233	MWO8	x		x	x	x	cut 4/14
	234	MWO8		10	10			large check
	235	MWO8		10	10			
	236	MWO8		10	10			
	237	MWO8		10	10			
	238	MWO8		10	10			large check
	239	MWO8		10	10			large check
	240	MWO8		10	10			
	241	MROB8	x		x	x	x	cut 4/10
	242	MROB8	x		x	x	x	cut 4/14
	243	MROB8	x		x	x	x	cut 5/12
	244	MWO8	x		x	x	x	cut 5/12
	245	MROB8		10	10			large check
	246	MROB8		10	10			
	247	MROB8		10	10			large check
	248	MROB8		10	10			large check
	249	MROB8		10	10			large check
	250	MROB8		10	9			spike kill
	251	MROB8		10	9			pic 09/DK
	252	MROCONT		9	10			
BioPres	253	MWOCONT		9	10			pic 09/DK top side
	254	MWOCONT		9	10			
	255	75						
	256	67						
	257	68						DK top side
	258	69						DK top side
	259	71						
	260	74						DK top side
	261	82						
	262	77						
	263	93						
	264	?						DK top side
	265	66						
	266	65						
	267	73						
KMG	270	1	x		x	x	x	cut 5/12
	271	14	x		x	x	x	cut 4/14

	272	12	10	10			large check
	273	16	10	10			
	274	15	10	10			large check
	275	18	10	10			
	276	19	10	10			
	277	10	x	x	x	x	cut 4/10
	278	30	x	x	x	x	cut 4/10
	279	33	x	x	x	x	cut 4/14
	280	34	10	10			
	281	24	10	10			
	282	27	10	10			large check
	283	28	10	10			
	284	29	10	10			large check
	285	32	10	10			large check
	286	13	10	10			large check
	287	31	x	x	x	x	cut 5/12
	288	9	10	10			large check
	289	25	10	10			
	290	22	9	10			
	291	44	8	10			large check
Koppers	292	11	x	x	x	x	cut 5/12
	293	?	10	10			
	294	?	10	10			
	295	?	10	10			
	296	19	x	x	x	x	cut 4/10
	297	15	x	x	x	x	cut 4/14
	298	?	10	10			
	299	?	10	10			large check
	300	47	x	x	x	x	cut 4/10
	301	44	x	x	x	x	cut 4/14
	302	41	10	10			
	303	55	10	10			large check
	304	60	10	10			
	305	43	x	x	x	x	cut 5/12
	306	51	10	10			
	307	?	10	10			
	308	76	10	10			large check
	309	65	10	10			
	310	61	x	x	x	x	cut 4/10
	311	70	x	x	x	x	cut 4/14
	312	72	10	10			
	313	71	10	10			
	314	64	10	10			
	315	2?	10	10			large check
	316	?	10	10			
	317	34	x	x	x	x	cut 4/10
	318	38	x	x	x	x	cut 5/12
	319	?	10	10			
	320	29	x	x	x	x	cut 4/14
	321	?	10	10			
	322	21?	10	10			
	323	31	10	10			

	324	35	10	10				
	325	23	10	10			large check	
	326	66	x	x	x	x	cut 5/12	
	327	67	10	10				
	328	42	10	10				
	329	49	10	10				
	330	7	10	10				
	331	8	10	10				
	332	WO	x	x	x	x	cut 5/12	
	333	RO	x	x	x	x	FST Alate wings found/cut 5/12	
	334	RO	4	9.5			pic 09/DK/large check	
Enviro	335	ctrl	4	10			large check	
	336	ctrl	9	10			large check	
	337	ctrl	8	10				

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Applicable Standards:

None: