Oregon
Kate Brown, Governor

Department of Environmental Quality
Agency Headquarters
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June 25, 2020

Collins Pine Company
1600 Missouri Avenue
Lakeview, OR 97630

Mr. Hughes,

DEQ appreciates timely submittal of the Cleaner Air Oregon (CAO) Risk Assessment Work Plan (Work Plan) for the Collins Pine Company (Collins) facility in Lakeview, OR. DEQ received your submittal on May 21, 2020 and has completed an initial review.

Based upon this review, DEQ has identified items to clarify in your May 21, 2020 submittal. **According to OAR 340-245-0030(2), DEQ is requesting you submit additional information to continue our review of your Work Plan by no later than July 25, 2020.**

Specific Comments

1. Please tabulate Risk-Based Concentrations (RBCs) to be used in the Risk Assessment for DEQ review and approval. Please provide this table in Excel format.

Minor Comments

2. Section 4.2 indicates that Collins plans to evaluate noncancer risk using target organs. To assist with that evaluation, DEQ is attaching the latest draft of Appendix F to the Draft Recommended Procedures for Toxic Air Contaminant Health Risk Assessments.
3. Section 5 of the Work Plan states that assuming a full 24-hour exposure duration to assess acute noncancer risk will provide a worst-case potential exposure duration. A 24-hour average exposure does not necessarily overestimate acute risk. It may underestimate risk if the toxicity reference value (TRV) is based on a lower exposure duration, such as one hour or eight hours. For an exposure period shorter than 24 hours, maximum concentrations will likely be higher than the 24-hour average.
4. Section 5 of the Work Plan states that the proposed calculation approach will result in an overestimation of risk. DEQ agrees that this approach will overestimate risk. Other approaches are available, such as using a risk equivalent emission rate (REER) to avoid this overestimation.
5. Section 5 of the Work Plan states that this risk assessment accounts for a person being exposed to the local facility emission rate for the entire exposure duration (i.e., 70 years), and that this will likely overestimate cancer and chronic noncancer risk. The assumption of a 70-year exposure duration does not mean that residents are expected to remain in the same house for 70 years; rather, that residents may remain in areas potentially impacted by emissions regulated by CAO for that exposure duration. It is reasonable to assume that many Oregonians will remain in the state for 70 years. If so, these Oregonians will be protected to the RALs established by CAO.
6. Section 5 of the Work Plan proposes to evaluate Polycyclic Aromatic Hydrocarbons (PAHs) without RBCs using the aggregate PAH RBC. Please assess risk using RBCs for individual PAHs where appropriate. Because carcinogenic PAHs are evaluated individually, there is no need to evaluate total PAHs (which have RBCs based on benzo[a]pyrene toxicity equivalents).

Confidential or trade secret information submitted to DEQ

DEQ is requesting that you submit additional information to complete your Work Plan. If you think that any of that information is confidential, trade secret or otherwise exempt from disclosure, in whole or in part, you must comply with the requirements in OAR 340-214-0130 to identify this information. This includes clearly marking each page of the writing with a request for exemption from disclosure and stating the specific statutory provision under which you claim exemption. Emissions data is not exempt from disclosure.

Please communicate any questions or clarifications regarding the above comments proactively in order to provide a timely, revised submittal by July 25, 2020. DEQ remains available during this timeframe to discuss the submittal with you and answer any questions you may have. Failure to provide additional information or corrections requested by DEQ may result in a violation of OAR 340-245-0030(1) and OAR 340-245-0040(1).

Once DEQ receives a revised submittal with the requested information, we will complete our review of the Work Plan. Please contact me directly at (503.229.5247, billings.kenzie@deq.state.or.us), and we look forward to your continued assistance with this process.

Sincerely,

Kenzie Billings

Digitally signed by Kenzie Billings
Date: 2020.06.25 16:13:37 -07'00'

Kenzie Billings
DEQ CAO Project Manager

Cc: Leslie Riley, MFA
Keith Johnson, DEQ
Mark Bailey, DEQ
Walt West, DEQ
Kenneth Hanna, DEQ
J.R. Giska, DEQ
File

Attachment: Appendix F, Draft Recommended Procedures for Toxic Air Contaminant Health Risk Assessments

DRAFT Table F-1
Chronic Target Organ Systems

DEQ ID	CASRN/ DEQ ID	Chemical	Noncancer Class		Chronic Target Organ Systems														
			HI3	HI5	Kidney	Liver	Blood	Endo	Musc	Eyes	Skin	Nerv	Cardio	Immune	Resp	Gastro	Develop	Repro
1	75-07-0	Acetaldehyde	HI3												X			
634	67-64-1	Acetone	HI3									X						
3	75-05-8	Acetonitrile	HI3									X			X			
5	107-02-8	Acrolein		HI5											X			
6	79-06-1	Acrylamide	HI3									X						
7	79-10-7	Acrylic acid	HI3												X			
8	107-13-1	Acrylonitrile	HI3												X			
12	107-05-1	Allyl chloride	HI3									X						
13	7429-90-5	Aluminum and compounds		HI5								X						
26	7664-41-7	Ammonia	HI3												X			
30	62-53-3	Aniline		HI5										X				
33	7440-36-0	Antimony and compounds	HI3												X			
37	7440-38-2	Arsenic and compounds	HI3									X						
39	7784-42-1	Arsine	HI3									X						
46	71-43-2	Benzene	HI3				X											
56	100-44-7	Benzyl chloride	HI3												X			
58	7440-41-7	Beryllium and compounds	HI3											X	X			
63	111-44-4	Bis(2-chloroethyl) ether (BCEE)	HI3															
64	542-88-1	Bis(chloromethyl) ether		HI5														
324	74-83-9	Bromomethane (Methyl bromide)	HI3												X			
73	106-94-5	1-Bromopropane (n-propyl bromide)	HI3									X						
75	106-99-0	1,3-Butadiene	HI3															X

DEQ ID	CASRN/ DEQ ID	Chemical	Noncancer Class		Chronic Target Organ Systems													
			HI3	HI5	Kidney	Liver	Blood	Endo	Musc	Eyes	Skin	Nerv	Cardio	Immune	Resp	Gastro	Develop	Repro
333	78-93-3	2-Butanone (Methyl ethyl ketone)	HI3														X	
79	78-92-2	sec-Butyl alcohol	HI3														X	
83	7440-43-9	Cadmium and compounds	HI3		X													
86	105-60-2	Caprolactam	HI3												X			
90	75-15-0	Carbon disulfide	HI3									X						
91	56-23-5	Carbon tetrachloride	HI3			X												
92	463-58-1	Carbonyl sulfide	HI3									X						
97	57-74-9	Chlordane	HI3			X												
101	7782-50-5	Chlorine	HI3												X			
102	10049-04-4	Chlorine dioxide	HI3												X			
104	532-27-4	2-Chloroacetophenone		HI5											X			
108	108-90-7	Chlorobenzene	HI3		X													
117	75-68-3	1-Chloro-1,1-difluoroethane	HI3									X						
246	75-45-6	Chlorodifluoromethane (Freon 22)	HI3		X			X										
230	75-00-3	Chloroethane (Ethyl chloride)	HI3						X								X	
118	67-66-3	Chloroform	HI3		X	X												
325	74-87-3	Chloromethane (Methyl chloride)	HI3									X						
130	76-06-2	Chloropicrin	HI3												X			
131	126-99-8	Chloroprene	HI3											X	X			
136	18540-29-9	Chromium VI, chromate and dichromate particulate	HI3												X			
140	7738-94-5	Chromium VI, chromic acid aerosol mist	HI3												X			
146	7440-48-4	Cobalt and compounds	HI3												X			
149	7440-50-8	Copper and compounds	HI3															

DEQ ID	CASRN/ DEQ ID	Chemical	Noncancer Class		Chronic Target Organ Systems													
			HI3	HI5	Kidney	Liver	Blood	Endo	Musc	Eyes	Skin	Nerv	Cardio	Immune	Resp	Gastro	Develop	Repro
152	1319-77-3	Cresols (mixture), including m-cresol, o-cresol, p-cresol	HI3									X						
161	74-90-8	Cyanide, Hydrogen	HI3					X										
162	110-82-7	Cyclohexane	HI3														X	
186	333-41-5	Diazinon	HI3															
190	96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	HI3															X
112	106-46-7	p-Dichlorobenzene (1,4-Dichlorobenzene)	HI3												X			
116	156-60-5	trans-1,2-dichloroethene	HI3															
328	75-09-2	Dichloromethane (Methylene chloride)	HI3			X												
195	78-87-5	1,2-Dichloropropane (Propylene dichloride)	HI3												X			
196	542-75-6	1,3-Dichloropropene	HI3												X			
197	62-73-7	Dichlorovos (DDVP)		HI5								X						
200	200	Diesel Particulate Matter	HI3												X			
201	111-42-2	Diethanolamine	HI3												X			
260	112-34-5	Diethylene glycol monobutyl ether	HI3			X												
261	111-90-0	Diethylene glycol monoethyl ether		HI5											X			
244	75-37-6	1,1-Difluoroethane		HI5								X						
211	68-12-2	Dimethyl formamide	HI3			X												
212	57-14-7	1,1-Dimethylhydrazine	HI3															
220	123-91-1	1,4-Dioxane	HI3												X			
224	298-04-4	Disulfoton	HI3															
225	106-89-8	Epichlorohydrin	HI3												X			
226	106-88-7	1,2-Epoxybutane		HI5											X			
228	140-88-5	Ethyl acrylate	HI3												X			

DEQ ID	CASRN/ DEQ ID	Chemical	Noncancer Class		Chronic Target Organ Systems													
			HI3	HI5	Kidney	Liver	Blood	Endo	Musc	Eyes	Skin	Nerv	Cardio	Immune	Resp	Gastro	Develop	Repro
229	100-41-4	Ethyl benzene	HI3		X													
232	106-93-4	Ethylene dibromide (EDB, 1,2-Dibromoethane)	HI3												X			
233	107-06-2	Ethylene dichloride (EDC, 1,2-Dichloroethane)	HI3									X						
234	107-21-1	Ethylene glycol	HI3												X			
267	111-76-2	Ethylene glycol monobutyl ether	HI3												X			
268	110-80-5	Ethylene glycol monoethyl ether	HI3				X											X
269	111-15-9	Ethylene glycol monoethyl ether acetate	HI3														X	
270	109-86-4	Ethylene glycol monomethyl ether	HI3															X
271	110-49-6	Ethylene glycol monomethyl ether acetate	HI3															X
236	75-21-8	Ethylene oxide	HI3									X						
239	239	Fluorides	HI3						X									
241	7782-41-4	Fluorine gas	HI3															
250	50-00-0	Formaldehyde	HI3												X			
254	111-30-8	Glutaraldehyde		HI5											X			
286	77-47-4	Hexachlorocyclopentadiene	HI3												X			
287	67-72-1	Hexachloroethane	HI3									X						
297	822-06-0	Hexamethylene-1,6-diisocyanate		HI5											X			
289	110-54-3	Hexane	HI3									X						
290	302-01-2	Hydrazine	HI3			X												
292	7647-01-0	Hydrochloric acid	HI3												X			
240	7664-39-3	Hydrogen fluoride	HI3															

DEQ ID	CASRN/ DEQ ID	Chemical	Noncancer Class		Chronic Target Organ Systems													
			HI3	HI5	Kidney	Liver	Blood	Endo	Musc	Eyes	Skin	Nerv	Cardio	Immune	Resp	Gastro	Develop	Repro
293	7783-06-4	Hydrogen sulfide	HI3												X			
300	78-59-1	Isophorone	HI3														X	
302	67-63-0	Isopropyl alcohol	HI3															X
157	98-82-8	Isopropylbenzene (Cumene)	HI3		X			X										
305	7439-92-1	Lead and compounds	HI3														X	
311	108-31-6	Maleic anhydride		HI5											X			
312	7439-96-5	Manganese and compounds	HI3									X						
316	7439-97-6	Mercury and compounds	HI3									X						
321	67-56-1	Methanol	HI3														X	
329	101-77-9	4,4'-Methylenedianiline (and its dichloride)		HI5						X								
337	108-10-1	Methyl isobutyl ketone (MIBK, Hexone)	HI3														X	
299	624-83-9	Methyl isocyanate	HI3												X			
339	80-62-6	Methyl methacrylate		HI5											X			
346	1634-04-4	Methyl tert-butyl ether	HI3		X					X								
298	101-68-8	Methylene diphenyl diisocyanate (MDI)	HI3												X			
428	91-20-3	Naphthalene	HI3									X			X			
365	365	Nickel compounds, insoluble	HI3											X	X			
368	368	Nickel compounds, soluble	HI3											X	X			
377	7697-37-2	Nitric acid		HI5														
381	98-95-3	Nitrobenzene	HI3												X			
389	79-46-9	2-Nitropropane	HI3			X												
589	8014-95-7	Oleum (fuming sulfuric acid)	HI3															
446	56-38-2	Parathion	HI3															
497	108-95-2	Phenol	HI3			X						X						

DEQ ID	CASRN/ DEQ ID	Chemical	Noncancer Class		Chronic Target Organ Systems													
			HI3	HI5	Kidney	Liver	Blood	Endo	Musc	Eyes	Skin	Nerv	Cardio	Immune	Resp	Gastro	Develop	Repro
503	75-44-5	Phosgene	HI3												X			
506	7803-51-2	Phosphine	HI3		X		X					X			X	X		
507	7664-38-2	Phosphoric acid	HI3												X			
636	12185-10-3	Phosphorus, white	HI3												X			
525	85-44-9	Phthalic anhydride	HI3							X					X			
447	447	Polybrominated diphenyl ethers (PBDEs)	HI3															
645	645	**Polychlorinated biphenyls (PCBs) TEQ**	HI3			X	X							X	X			
463	32598-13-3	*PCB 77 [3,3',4,4'-tetrachlorobiphenyl]*	HI3			X	X							X	X			
464	70362-50-4	*PCB 81 [3,4,4',5-tetrachlorobiphenyl]*	HI3			X	X							X	X			
466	32598-14-4	*PCB 105 [2,3,3',4,4'-pentachlorobiphenyl]*	HI3			X	X							X	X			
467	74472-37-0	*PCB 114 [2,3,4,4',5-pentachlorobiphenyl]*	HI3			X	X							X	X			
468	31508-00-6	*PCB 118 [2,3',4,4',5-pentachlorobiphenyl]*	HI3			X	X							X	X			
469	65510-44-3	*PCB 123 [2,3',4,4',5'-pentachlorobiphenyl]*	HI3			X	X							X	X			
470	57465-28-8	*PCB 126 [3,3',4,4',5-pentachlorobiphenyl]*	HI3			X	X							X	X			
474	38380-08-4	*PCB 156 [2,3,3',4,4',5-hexachlorobiphenyl]*	HI3			X	X							X	X			
475	69782-90-7	*PCB 157 [2,3,3',4,4',5'-hexachlorobiphenyl]*	HI3			X	X							X	X			
476	52663-72-6	*PCB 167 [2,3',4,4',5,5'-hexachlorobiphenyl]*	HI3			X	X							X	X			
477	32774-16-6	*PCB 169 [3,3',4,4',5,5'-hexachlorobiphenyl]*	HI3			X	X							X	X			
481	39635-31-9	*PCB 189 [2,3,3',4,4',5,5'-heptachlorobiphenyl]*	HI3			X	X							X	X			

DEQ ID	CASRN/ DEQ ID	Chemical	Noncancer Class		Chronic Target Organ Systems													
			HI3	HI5	Kidney	Liver	Blood	Endo	Musc	Eyes	Skin	Nerv	Cardio	Immune	Resp	Gastro	Develop	Repro
646	646	**Polychlorinated dibenzo-p-dioxins (PCDDs) & dibenzofurans (PCDFs) TEQ**	HI3			X	X							X	X			
527	1746-01-6	*2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)*	HI3			X	X							X	X			
528	40321-76-4	*1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)*	HI3			X	X							X	X			
529	39227-28-6	*1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)*	HI3			X	X							X	X			
530	57653-85-7	*1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)*	HI3			X	X							X	X			
531	19408-74-3	*1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)*	HI3			X	X							X	X			
532	35822-46-9	*1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)*	HI3			X	X							X	X			
533	3268-87-9	*Octachlorodibenzo-p-dioxin (OCDD)*	HI3			X	X							X	X			
539	51207-31-9	*2,3,7,8-Tetrachlorodibenzofuran (TcDF)*	HI3			X	X							X	X			
540	57117-41-6	*1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)*	HI3			X	X							X	X			
541	57117-31-4	*2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)*	HI3			X	X							X	X			

DEQ ID	CASRN/ DEQ ID	Chemical	Noncancer Class		Chronic Target Organ Systems													
			HI3	HI5	Kidney	Liver	Blood	Endo	Musc	Eyes	Skin	Nerv	Cardio	Immune	Resp	Gastro	Develop	Repro
542	70648-26-9	*1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)*	HI3			X	X							X	X			
543	57117-44-9	*1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)*	HI3			X	X							X	X			
544	72918-21-9	*1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)*	HI3			X	X							X	X			
545	60851-34-5	*2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)*	HI3			X	X							X	X			
546	67562-39-4	*1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)*	HI3			X	X							X	X			
547	55673-89-7	*1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)*	HI3			X	X							X	X			
548	39001-02-0	*Octachlorodibenzofuran (OCDF)*	HI3			X	X							X	X			
406	50-32-8	Benzo[a]pyrene	HI3														X	
559	123-38-6	Propionaldehyde		HI5											X			
561	115-07-1	Propylene		HI5											X			
562	6423-43-4	Propylene glycol dinitrate		HI5			X											
273	107-98-2	Propylene glycol monomethyl ether	HI3			X												
563	75-56-9	Propylene oxide	HI3												X			
572	572	Refractory Ceramic Fibers		HI5											X			
577	7783-07-5	Selenide, hydrogen	HI3															
575	7782-49-2	Selenium and compounds	HI3															
579	7631-86-9	Silica, crystalline (respirable)		HI5											X			

DEQ ID	CASRN/ DEQ ID	Chemical	Noncancer Class		Chronic Target Organ Systems													
			HI3	HI5	Kidney	Liver	Blood	Endo	Musc	Eyes	Skin	Nerv	Cardio	Immune	Resp	Gastro	Develop	Repro
582	1310-73-2	Sodium hydroxide	HI3															
585	100-42-5	Styrene	HI3									X						
588	505-60-2	Sulfur Mustard	HI3															
590	7446-11-9	Sulfur trioxide		HI5											X			
591	7664-93-9	Sulfuric acid		HI5											X			
488	127-18-4	Tetrachloroethene (Perchloroethylene)	HI3									X						
245	811-97-2	1,1,1,2-Tetrafluoroethane	HI3															X
599	7550-45-0	Titanium tetrachloride	HI3												X			
600	108-88-3	Toluene	HI3									X						
601	26471-62-5	Toluene diisocyanates (2,4- and 2,6-)	HI3												X			
326	71-55-6	1,1,1-Trichloroethane (Methyl chloroform)	HI3			X												
608	79-01-6	Trichloroethene (TCE, Trichloroethylene)	HI3											X			X	
609	96-18-4	1,2,3-Trichloropropane		HI5											X			
610	121-44-8	Triethylamine	HI3			X				X					X			
613	526-73-8	1,2,3-Trimethylbenzene	HI3									X						
614	95-63-6	1,2,4-Trimethylbenzene	HI3									X						
615	108-67-8	1,3,5-Trimethylbenzene	HI3									X						
620	7440-62-2	Vanadium (fume or dust)	HI3												X			
621	1314-62-1	Vanadium pentoxide	HI3												X			
622	108-05-4	Vinyl acetate	HI3												X			
623	593-60-2	Vinyl bromide		HI5		X												
624	75-01-4	Vinyl chloride	HI3			X												
627	75-35-4	Vinylidene chloride	HI3			X												
628	1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xylene	HI3							X		X			X			

DEQ ID	CASRN/ DEQ ID	Chemical	Noncancer Class		Chronic Target Organ Systems													
			HI3	HI5	Kidney	Liver	Blood	Endo	Musc	Eyes	Skin	Nerv	Cardio	Immune	Resp	Gastro	Develop	Repro

Notes for Table F-1:
CASRN = Chemical Abstracts Service Registry Number
If no CASRN is available, DEQ identification number is provided.
Endo = Endocrine system
Musc = Musculo-skeletal system
Nerv = Nervous system
Cardio = Cardiovascular system
Immune = Immune system
Resp = Respiratory system
Gastro = Gastrointestinal system
Develop = Developmental effects
Repro = Reproductive effects
Bold text= Category name
Italic text = Chemical within a category
HI3 = chemical assigned a noncancer Toxics Best Available Control Technology Risk Action Level hazard index of 3.
HI5 = chemical assigned a noncancer Toxics Best Available Control Technology Risk Action Level hazard index of 5.

DRAFT Table F-2
Acute Target Organ Systems

DEQ ID	CASRN/ DEQ ID	Chemical	Noncancer Class		Acute Target Organ Systems													
			HI3	HI5	Kidney	Liver	Blood	Endo	Musc	Eyes	Skin	Nerv	Cardio	Immune	Resp	Gastro	Develop	Repro
1	75-07-0	Acetaldehyde	HI3							X					X			
634	67-64-1	Acetone	HI3									X						
3	75-05-8	Acetonitrile	HI3															
5	107-02-8	Acrolein		HI5											X			
6	79-06-1	Acrylamide	HI3															
7	79-10-7	Acrylic acid	HI3												X			
8	107-13-1	Acrylonitrile	HI3									X						
12	107-05-1	Allyl chloride	HI3															
13	7429-90-5	Aluminum and compounds		HI5														
26	7664-41-7	Ammonia	HI3							X					X			
30	62-53-3	Aniline		HI5														
33	7440-36-0	Antimony and compounds	HI3												X			
37	7440-38-2	Arsenic and compounds	HI3														X	
39	7784-42-1	Arsine	HI3														X	
46	71-43-2	Benzene	HI3											X				
56	100-44-7	Benzyl chloride	HI3							X					X			
58	7440-41-7	Beryllium and compounds	HI3											X	X			
63	111-44-4	Bis(2-chloroethyl) ether (BCEE)	HI3									X			X			
64	542-88-1	Bis(chloromethyl) ether		HI5											X			
324	74-83-9	Bromomethane (Methyl bromide)	HI3									X						
73	106-94-5	1-Bromopropane (n-propyl bromide)	HI3									X						
75	106-99-0	1,3-Butadiene	HI3														X	
333	78-93-3	2-Butanone (Methyl ethyl ketone)	HI3														X	
79	78-92-2	sec-Butyl alcohol	HI3															
83	7440-43-9	Cadmium and compounds	HI3												X			
86	105-60-2	Caprolactam	HI3							X								
90	75-15-0	Carbon disulfide	HI3									X					X	
91	56-23-5	Carbon tetrachloride	HI3														X	X
92	463-58-1	Carbonyl sulfide	HI3									X						
97	57-74-9	Chlordane	HI3			X												
101	7782-50-5	Chlorine	HI3												X			
102	10049-04-4	Chlorine dioxide	HI3												X			
104	532-27-4	2-Chloroacetophenone		HI5														
108	108-90-7	Chlorobenzene	HI3															
117	75-68-3	1-Chloro-1,1-difluoroethane	HI3															
246	75-45-6	Chlorodifluoromethane (Freon 22)	HI3															
230	75-00-3	Chloroethane (Ethyl chloride)	HI3														X	

DEQ ID	CASRN/ DEQ ID	Chemical	Noncancer Class		Acute Target Organ Systems													
			HI3	HI5	Kidney	Liver	Blood	Endo	Musc	Eyes	Skin	Nerv	Cardio	Immune	Resp	Gastro	Develop	Repro
118	67-66-3	Chloroform	HI3			X												
325	74-87-3	Chloromethane (Methyl chloride)	HI3									X						
130	76-06-2	Chloropicrin	HI3												X			
131	126-99-8	Chloroprene	HI3															
136	18540-29-9	Chromium VI, chromate and dichromate particulate	HI3												X			
140	7738-94-5	Chromium VI, chromic acid aerosol mist	HI3												X			
146	7440-48-4	Cobalt and compounds	HI3															
149	7440-50-8	Copper and compounds	HI3												X			
152	1319-77-3	Cresols (mixture), including m-cresol, o-cresol, p-cresol	HI3															
161	74-90-8	Cyanide, Hydrogen	HI3									X						
162	110-82-7	Cyclohexane	HI3															
186	333-41-5	Diazinon	HI3									X						
190	96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	HI3															X
112	106-46-7	p-Dichlorobenzene (1,4-Dichlorobenzene)	HI3							X					X			
116	156-60-5	trans-1,2-dichloroethene	HI3			X												
328	75-09-2	Dichloromethane (Methylene chloride)	HI3									X						
195	78-87-5	1,2-Dichloropropane (Propylene dichloride)	HI3												X			
196	542-75-6	1,3-Dichloropropene	HI3												X			
197	62-73-7	Dichlorovos (DDVP)		HI5								X						
200	200	Diesel Particulate Matter	HI3															
201	111-42-2	Diethanolamine	HI3															
260	112-34-5	Diethylene glycol monobutyl ether	HI3															
261	111-90-0	Diethylene glycol monoethyl ether		HI5														
244	75-37-6	1,1-Difluoroethane		HI5														
211	68-12-2	Dimethyl formamide	HI3															
212	57-14-7	1,1-Dimethylhydrazine	HI3			X												
220	123-91-1	1,4-Dioxane	HI3							X					X			
224	298-04-4	Disulfoton	HI3									X						
225	106-89-8	Epichlorohydrin	HI3							X					X			
226	106-88-7	1,2-Epoxybutane		HI5														
228	140-88-5	Ethyl acrylate	HI3															
229	100-41-4	Ethyl benzene	HI3									X						
232	106-93-4	Ethylene dibromide (EDB, 1,2-Dibromoethane)	HI3															
233	107-06-2	Ethylene dichloride (EDC, 1,2-Dichloroethane)	HI3															

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			HI3	HI5	Kidney	Liver	Blood	Endo	Musc	Eyes	Skin	Nerv	Cardio	Immune	Resp	Gastro	Develop	Repro
234	107-21-1	Ethylene glycol	HI3												X			
267	111-76-2	Ethylene glycol monobutyl ether	HI3				X											
268	110-80-5	Ethylene glycol monoethyl ether	HI3														X	
269	111-15-9	Ethylene glycol monoethyl ether acetate	HI3														X	
270	109-86-4	Ethylene glycol monomethyl ether	HI3														X	
271	110-49-6	Ethylene glycol monomethyl ether acetate	HI3															
236	75-21-8	Ethylene oxide	HI3		X													
239	239	Fluorides	HI3												X			
241	7782-41-4	Fluorine gas	HI3							X					X			
250	50-00-0	Formaldehyde	HI3												X			
254	111-30-8	Glutaraldehyde		HI5											X			
286	77-47-4	Hexachlorocyclopentadiene	HI3												X			
287	67-72-1	Hexachloroethane	HI3									X						
297	822-06-0	Hexamethylene-1,6-diisocyanate		HI5											X			
289	110-54-3	Hexane	HI3															
290	302-01-2	Hydrazine	HI3			X												
292	7647-01-0	Hydrochloric acid	HI3												X			
240	7664-39-3	Hydrogen fluoride	HI3												X			
293	7783-06-4	Hydrogen sulfide	HI3												X			
300	78-59-1	Isophorone	HI3															
302	67-63-0	Isopropyl alcohol	HI3							X					X			
157	98-82-8	Isopropylbenzene (Cumene)	HI3															
305	7439-92-1	Lead and compounds	HI3														X	
311	108-31-6	Maleic anhydride		HI5														
312	7439-96-5	Manganese and compounds	HI3									X						
316	7439-97-6	Mercury and compounds	HI3									X					X	
321	67-56-1	Methanol	HI3									X						
329	101-77-9	4,4'-Methylenedianiline (and its dichloride)		HI5														
337	108-10-1	Methyl isobutyl ketone (MIBK, Hexone)	HI3															
299	624-83-9	Methyl isocyanate	HI3															
339	80-62-6	Methyl methacrylate		HI5														
346	1634-04-4	Methyl tert-butyl ether	HI3									X						
298	101-68-8	Methylene diphenyl diisocyanate (MDI)	HI3												X			
428	91-20-3	Naphthalene	HI3												X			
365	365	Nickel compounds, insoluble	HI3											X				
368	368	Nickel compounds, soluble	HI3											X				
377	7697-37-2	Nitric acid		HI5											X			

DEQ ID	CASRN/ DEQ ID	Chemical	Noncancer Class		Acute Target Organ Systems													
			HI3	HI5	Kidney	Liver	Blood	Endo	Musc	Eyes	Skin	Nerv	Cardio	Immune	Resp	Gastro	Develop	Repro
381	98-95-3	Nitrobenzene	HI3															
389	79-46-9	2-Nitropropane	HI3															
589	8014-95-7	Oleum (fuming sulfuric acid)	HI3												X			
446	56-38-2	Parathion	HI3									X						
497	108-95-2	Phenol	HI3							X					X			
503	75-44-5	Phosgene	HI3												X			
506	7803-51-2	Phosphine	HI3															
507	7664-38-2	Phosphoric acid	HI3															
636	12185-10-3	Phosphorus, white	HI3												X			
525	85-44-9	Phthalic anhydride	HI3															
447	447	Polybrominated diphenyl ethers (PBDEs)	HI3					X										
645	645	**Polychlorinated biphenyls (PCBs) TEQ**	HI3															
463	32598-13-3	*PCB 77 [3,3',4,4'-tetrachlorobiphenyl]*	HI3															
464	70362-50-4	*PCB 81 [3,4,4',5-tetrachlorobiphenyl]*	HI3															
466	32598-14-4	*PCB 105 [2,3,3',4,4'-pentachlorobiphenyl]*	HI3															
467	74472-37-0	*PCB 114 [2,3,4,4',5-pentachlorobiphenyl]*	HI3															
468	31508-00-6	*PCB 118 [2,3',4,4',5-pentachlorobiphenyl]*	HI3															
469	65510-44-3	*PCB 123 [2,3',4,4',5'-pentachlorobiphenyl]*	HI3															
470	57465-28-8	*PCB 126 [3,3',4,4',5-pentachlorobiphenyl]*	HI3															
474	38380-08-4	*PCB 156 [2,3,3',4,4',5-hexachlorobiphenyl]*	HI3															
475	69782-90-7	*PCB 157 [2,3,3',4,4',5'-hexachlorobiphenyl]*	HI3															
476	52663-72-6	*PCB 167 [2,3',4,4',5,5'-hexachlorobiphenyl]*	HI3															
477	32774-16-6	*PCB 169 [3,3',4,4',5,5'-hexachlorobiphenyl]*	HI3															
481	39635-31-9	*PCB 189 [2,3,3',4,4',5,5'-heptachlorobiphenyl]*	HI3															
646	646	**Polychlorinated dibenzo-p-dioxins (PCDDs) & dibenzofurans (PCDFs) TEQ**	HI3															
527	1746-01-6	*2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)*	HI3															
528	40321-76-4	*1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)*	HI3															
529	39227-28-6	*1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)*	HI3															
530	57653-85-7	*1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)*	HI3															

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			HI3	HI5	Kidney	Liver	Blood	Endo	Musc	Eyes	Skin	Nerv	Cardio	Immune	Resp	Gastro	Develop	Repro
531	19408-74-3	*1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)*	HI3															
532	35822-46-9	*1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)*	HI3															
533	3268-87-9	*Octachlorodibenzo-p-dioxin (OCDD)*	HI3															
539	51207-31-9	*2,3,7,8-Tetrachlorodibenzofuran (TcDF)*	HI3															
540	57117-41-6	*1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)*	HI3															
541	57117-31-4	*2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)*	HI3															
542	70648-26-9	*1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)*	HI3															
543	57117-44-9	*1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)*	HI3															
544	72918-21-9	*1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)*	HI3															
545	60851-34-5	*2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)*	HI3															
546	67562-39-4	*1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)*	HI3															
547	55673-89-7	*1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)*	HI3															
548	39001-02-0	*Octachlorodibenzofuran (OCDF)*	HI3															
406	50-32-8	Benzo[a]pyrene	HI3														X	X
559	123-38-6	Propionaldehyde		HI5														
561	115-07-1	Propylene		HI5														
562	6423-43-4	Propylene glycol dinitrate		HI5								X						
273	107-98-2	Propylene glycol monomethyl ether	HI3															
563	75-56-9	Propylene oxide	HI3												X			
572	572	Refractory Ceramic Fibers		HI5														
577	7783-07-5	Selenide, hydrogen	HI3							X					X			
575	7782-49-2	Selenium and compounds	HI3							X	X	X			X			
579	7631-86-9	Silica, crystalline (respirable)		HI5														
582	1310-73-2	Sodium hydroxide	HI3							X	X				X			
585	100-42-5	Styrene	HI3									X						

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			HI3	HI5	Kidney	Liver	Blood	Endo	Musc	Eyes	Skin	Nerv	Cardio	Immune	Resp	Gastro	Develop	Repro
588	505-60-2	Sulfur Mustard	HI3							X								
590	7446-11-9	Sulfur trioxide		HI5											X			
591	7664-93-9	Sulfuric acid		HI5											X			
488	127-18-4	Tetrachloroethene (Perchloroethylene)	HI3									X						
245	811-97-2	1,1,1,2-Tetrafluoroethane	HI3															
599	7550-45-0	Titanium tetrachloride	HI3												X			
600	108-88-3	Toluene	HI3									X						
601	26471-62-5	Toluene diisocyanates (2,4- and 2,6-)	HI3												X			
326	71-55-6	1,1,1-Trichloroethane (Methyl chloroform)	HI3									X						
608	79-01-6	Trichloroethene (TCE, Trichloroethylene)	HI3											X			X	
609	96-18-4	1,2,3-Trichloropropane		HI5											X			
610	121-44-8	Triethylamine	HI3							X								
613	526-73-8	1,2,3-Trimethylbenzene	HI3															
614	95-63-6	1,2,4-Trimethylbenzene	HI3															
615	108-67-8	1,3,5-Trimethylbenzene	HI3															
620	7440-62-2	Vanadium (fume or dust)	HI3												X			
621	1314-62-1	Vanadium pentoxide	HI3												X			
622	108-05-4	Vinyl acetate	HI3												X			
623	593-60-2	Vinyl bromide		HI5														
624	75-01-4	Vinyl chloride	HI3														X	
627	75-35-4	Vinylidene chloride	HI3			X												
628	1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xylene	HI3									X			X			

Notes for Table F-2:

CASRN = Chemical Abstracts Service Registry Number

If no CASRN is available, DEQ identification number is provided.

Endo = Endocrine system

Musc = Musculo-skeletal system

Nerv = Nervous system

Cardio = Cardiovascular system

Immune = Immune system

Resp = Respiratory system

Gastro = Gastrointestinal system

Develop = Developmental effects

Repro = Reproductive effects

Bold text = Category name

Italic text = Chemical within a category

HI3 = chemical assigned a noncancer Toxics Best Available Control Technology Risk Action Level hazard index of 3.

HI5 = chemical assigned a noncancer Toxics Best Available Control Technology Risk Action Level hazard index of 5.