Appendix B
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Table B1.1 **YTI Construction Schedule - Proposed Project**

Proposed Project	Start Year	Duration (days)	Duration (months)	Hr/Day	2015 5	6	7	8	9	10	11	12	2016 1	2
PHASE 1: Berth 217-220 Dredging, Wharf Improvements, TICTF Expansion														
Mobilization/Prep/Coordination	2015	20	1.00											
Sheet Piling 1	2015	35	1.75	8				1	1					
Sheet Piling 2	2015	35	1.75	8						1	1			
Dredging - Ocean Disposal	2015	4	0.20	24								0		
Dredging - Upland Disposal	2015	12	0.60	24								1		
Crane Rail Extension	2015	50	2.50	8		1	1	1						
TICTF Expansion	2015	60	3.00	8								1	1	1
PHASE 1: Crane Removal, Relocation, Delivery														
2 LAHD Crane Relocation (B217-220)	2015	10	0.50	8			1							
2 YTI Crane Relocation/Realignment (B217-220)	2015	10	0.5	8								1		
4 New YTI Crane Delivery (B217-220)	2015	7	0.4	8								1		
6 Crane Height Raising and Boom Extension (4 cranes at B212-213, 2 cr	2015	120	6.0	8								1	1	1
PHASE 2: Berth 214-216 Dredging, Wharf & Backland Improvements														
Sheet and King Pile Installation 1	2016	50	2.50	8										
Sheet and King Pile Installation 2	2016	50	2.50	8										
Dredging - Ocean Disposal	2016	6	0.30	24										
Dredging - Upland Disposal	2016	17	0.85	24										
Concrete Runway	2015	10	0.50	8		1								
Cold plane and ac overlay	2015	8	0.40	8			1							
Slurry seal	2015	30	1.50	8				1						1
Striping	2015	20	1.00	8			1	1						
Final Inspections/Project closeout	2016	10	0.50											

Table B1.2 **YTI Construction Schedule - Alternative 2 (No Federal Action), NEPA Baseline**

Alternative 2 - No Fed Action - NEPA Baseline	Start Year	Duration (days)	Duration (months)	Hr/Day	2015 5	6	7	8	9	10	11	12	2016 1	2
PHASE 1: Berth 217-220 Dredging, Wharf Improvements, TICTF Expansion														
Mobilization/Prep/Coordination	2015	20	1.00											
Sheet Piling 1	2015	35	1.75	8										
Sheet Piling 2	2015	35	1.75	8										
Dredging - Ocean Disposal	2015	4	0.20	24										
Dredging - Upland Disposal	2015	12	0.60	24										
Crane Rail Extension	2015	50	2.50	8										
TICTF Expansion	2015	60	3.00	8										
PHASE 1: Crane Removal, Relocation, Delivery														
2 LAHD Crane Relocation (B217-220)	2015	10	0.50	8										
2 YTI Crane Relocation/Realignment (B217-220)	2015	10	0.5	8										
4 New YTI Crane Delivery (B217-220)	2015	7	0.4	8										
6 Crane Height Raising and Boom Extension (4 cranes at B212-213, 2 cr	2015	120	6.0	8										
PHASE 2: Berth 214-216 Dredging, Wharf & Backland Improvements														
Sheet and King Pile Installation 1	2016	50	2.50	8										
Sheet and King Pile Installation 2	2016	50	2.50	8										
Dredging - Ocean Disposal	2016	6	0.30	24										
Dredging - Upland Disposal	2016	17	0.85	24										
Concrete Runway	2015	10	0.50	8		1								
Cold plane and ac overlay	2015	8	0.40	8			1							
Slurry seal	2015	30	1.50	8				1						1
Striping	2015	20	1.00	8			1	1	1	1				
Final Inspections/Project closeout	2016	10	0.50											

Table B1.1

Proposed Project	3	4	5	6	7	8	9	10	11	12	2017 1	2
PHASE 1: Berth 217-220 Dredging, Wharf Improvements, TICTF E												
Mobilization/Prep/Coordination												
Sheet Piling 1												
Sheet Piling 2												
Dredging - Ocean Disposal												
Dredging - Upland Disposal												
Crane Rail Extension												
TICTF Expansion	1											
PHASE 1: Crane Removal, Relocation, Delivery												
2 LAHD Crane Relocation (B217-220)												
2 YTI Crane Relocation/Realignment (B217-220)												
4 New YTI Crane Delivery (B217-220)												
6 Crane Height Raising and Boom Extension (4 cranes at B212-213, 2 cr	1	1	1									
PHASE 2: Berth 214-216 Dredging, Wharf & Backland Improvemen												
Sheet and King Pile Installation 1	1	1	1									
Sheet and King Pile Installation 2				1	1	1						
Dredging - Ocean Disposal						0	0					
Dredging - Upland Disposal						1	1					
Concrete Runway												
Cold plane and ac overlay												
Slurry seal												
Striping								1	1			
Final Inspections/Project closeout												

Table B1.2

Alternative 2 - No Fed Action - NEPA Baseline	3	4	5	6	7	8	9	10	11	12	2017 1	2
PHASE 1: Berth 217-220 Dredging, Wharf Improvements, TICTF E												
Mobilization/Prep/Coordination												
Sheet Piling 1												
Sheet Piling 2												
Dredging - Ocean Disposal												
Dredging - Upland Disposal												
Crane Rail Extension												
TICTF Expansion												
PHASE 1: Crane Removal, Relocation, Delivery												
2 LAHD Crane Relocation (B217-220)												
2 YTI Crane Relocation/Realignment (B217-220)												
4 New YTI Crane Delivery (B217-220)												
6 Crane Height Raising and Boom Extension (4 cranes at B212-213, 2 cr												
PHASE 2: Berth 214-216 Dredging, Wharf & Backland Improvemen												
Sheet and King Pile Installation 1												
Sheet and King Pile Installation 2												
Dredging - Ocean Disposal												
Dredging - Upland Disposal												
Concrete Runway												
Cold plane and ac overlay												
Slurry seal												
Striping												
Final Inspections/Project closeout												

Table B1.3 **YTI Construction Schedule - Alternative 3 (Reduced Project)**

Alternative 3 - Reduced Project	Start Year	Duration (days)	Duration (months)	Hr/Day	2015 5	6	7	8	9	10	11	12	2016 1	2
PHASE 1: Berth 217-220 Dredging, Wharf Improvements, TICTF Expansion														
Mobilization/Prep/Coordination	2015	20	1.00											
Sheet Piling 1	2015	35	1.75	8				1	1					
Sheet Piling 2	2015	35	1.75	8						1	1			
Dredging - Ocean Disposal	2015	4	0.20	24								0		
Dredging - Upland Disposal	2015	12	0.60	24								1		
Crane Rail Extension	2015	50	2.50	8		1	1	1						
TICTF Expansion	2015	60	3.00	8								1	1	1
PHASE 1: Crane Removal, Relocation, Delivery														
2 LAHD Crane Relocation (B217-220)	2015	10	0.50	8			1							
2 YTI Crane Relocation/Realignment (B217-220)	2015	10	0.5	8								1		
4 New YTI Crane Delivery (B217-220)	2015	7	0.4	8								1		
6 Crane Height Raising and Boom Extension (4 cranes at B212-213, 2 cr	2015	120	6.0	8								1	1	1
PHASE 2: Berth 214-216 Dredging, Wharf & Backland Improvements														
Sheet and King Pile Installation 1	2016	50	2.50	8										
Sheet and King Pile Installation 2	2016	50	2.50	8										
Dredging - Ocean Disposal	2016	6	0.30	24										
Dredging - Upland Disposal	2016	17	0.85	24										
Concrete Runway	2015	10	0.50	8		1								
Cold plane and ac overlay	2015	8	0.40	8			1							
Slurry seal	2015	30	1.50	8				1						1
Striping	2015	20	1.00	8			1	1						
Final Inspections/Project closeout	2016	10	0.50											

Table B1.3

Alternative 3 - Reduced Project	3	4	5	6	7	8	9	10	11	12	2017 1	2
PHASE 1: Berth 217-220 Dredging, Wharf Improvements, TICTF E												
Mobilization/Prep/Coordination												
Sheet Piling 1												
Sheet Piling 2												
Dredging - Ocean Disposal												
Dredging - Upland Disposal												
Crane Rail Extension												
TICTF Expansion	1											
PHASE 1: Crane Removal, Relocation, Delivery												
2 LAHD Crane Relocation (B217-220)												
2 YTI Crane Relocation/Realignment (B217-220)												
4 New YTI Crane Delivery (B217-220)												
6 Crane Height Raising and Boom Extension (4 cranes at B212-213, 2 cr	1	1	1									
PHASE 2: Berth 214-216 Dredging, Wharf & Backland Improvemen												
Sheet and King Pile Installation 1												
Sheet and King Pile Installation 2												
Dredging - Ocean Disposal												
Dredging - Upland Disposal												
Concrete Runway												
Cold plane and ac overlay												
Slurry seal												
Striping								1	1			
Final Inspections/Project closeout												

Table B1.4 **Construction Offroad Engine Characteristics and Emission Factors**

Year	Source Description	OFFROAD2011 Category	Engine (kW)	Engine (Hp)	Load Factor	Emission Factor Units	Emission Factors, Unmitigated (unloaded) PM10	PM2.5	DPM	NOx	SOx	CO	HC	VOC	CO2	CH4	N2O
2015																	
2015	blade/grader	Graders	162	217	0.41	g/hp-hr	0.18565	0.17080	0.18565	5.72764	0.01010	5.0	0.32730	0.34465	538.22334	0.03057	0.01371
2015	crane	Cranes	208	279	0.29	g/hp-hr	0.25337	0.23310	0.25337	6.12414	0.00998	2.2	0.39259	0.41340	532.05105	0.03022	0.01355
2015	dozer	Rubber Tired Dozers	358	480	0.40	g/hp-hr	0.37313	0.34328	0.37313	7.99750	0.01014	4.0	0.58489	0.61589	540.32537	0.03069	0.01376
2015	excavator	Excavators	157	211	0.38	g/hp-hr	0.13307	0.12242	0.13307	4.18229	0.01000	5.0	0.23858	0.25122	532.94436	0.03027	0.01357
2015	forklift	Forklifts	149	200	0.20	g/hp-hr	0.29781	0.27399	0.29781	6.69679	0.01002	5.0	0.46671	0.49145	533.68728	0.03032	0.01359
2015	loader	Tractors/Loaders/Backhoes	75	101	0.37	g/hp-hr	0.42440	0.39045	0.42440	5.42219	0.01010	8.4	0.47052	0.49546	538.47071	0.03059	0.01371
2015	paving machine	Paving Equipment	82	110	0.36	g/hp-hr	0.47074	0.43308	0.47074	6.14464	0.01002	10.3	0.54628	0.57523	534.10140	0.03034	0.01360
2015	pneumatic lift	Other Construction Equipment	34	46	0.42	g/hp-hr	0.50336	0.46309	0.50336	5.56407	0.01119	5.2	1.08179	1.13913	596.39565	0.03388	0.01519
2015	prentice loader	Other Construction Equipment	261	350	0.42	g/hp-hr	0.51185	0.47091	0.51185	6.53660	0.00996	7.6	0.59746	0.62913	530.98261	0.03016	0.01352
2015	regulator	Other Construction Equipment	168	225	0.42	g/hp-hr	0.16263	0.14962	0.16263	4.41527	0.01006	1.7	0.26806	0.28227	536.21228	0.03046	0.01365
2015	roller	Rollers	84	113	0.38	g/hp-hr	0.46739	0.43000	0.46739	6.27168	0.01003	9.0	0.56475	0.59468	534.45320	0.03036	0.01361
2015	skip loader	Skid Steer Loaders	75	101	0.37	g/hp-hr	0.22021	0.20259	0.22021	3.81067	0.00999	7.1	0.24286	0.25573	532.46510	0.03025	0.01356
2015	slurry truck	Off-Highway Trucks	381	511	0.38	g/hp-hr	0.20846	0.19178	0.20846	5.12436	0.01005	1.9	0.37330	0.39308	535.63804	0.03043	0.01364
2015	speed swing	Other Construction Equipment	327	439	0.42	g/hp-hr	0.16263	0.14962	0.16263	4.41527	0.01006	1.7	0.26806	0.28227	536.21228	0.03046	0.01365
2015	striping truck	Other Construction Equipment	4	5	0.42	g/hp-hr	0.50336	0.46309	0.50336	5.56407	0.01119	5.2	1.08179	1.13913	596.39565	0.03388	0.01519
2015	sweeping truck	Off-Highway Trucks	381	511	0.38	g/hp-hr	0.20846	0.19178	0.20846	5.12436	0.01005	1.9	0.37330	0.39308	535.63804	0.03043	0.01364
2015	swivel dump	Other Construction Equipment	327	439	0.42	g/hp-hr	0.16263	0.14962	0.16263	4.41527	0.01006	1.7	0.26806	0.28227	536.21228	0.03046	0.01365
2015	tamper	Surfacing Equipment	392	526	0.30	g/hp-hr	0.10399	0.09567	0.10399	3.28684	0.00998	2.2	0.14683	0.15461	531.96628	0.03022	0.01355
2015	tie truck	Off-Highway Trucks	381	511	0.38	g/hp-hr	0.20846	0.19178	0.20846	5.12436	0.01005	1.9	0.37330	0.39308	535.63804	0.03043	0.01364
2015	jet pump	Other Construction Equipment	84	113	0.42	g/hp-hr	0.51185	0.47091	0.51185	6.53660	0.00996	7.6	0.59746	0.62913	530.98261	0.03016	0.01352
2015	scraper	Scrapers	356	477	0.48	g/hp-hr	0.24580	0.22613	0.24580	6.08587	0.01000	2.8	0.39026	0.41095	532.83159	0.03027	0.01357
2015	water truck	Off-Highway Trucks	381	511	0.38	g/hp-hr	0.20846	0.19178	0.20846	5.12436	0.01005	1.9	0.37330	0.39308	535.63804	0.03043	0.01364
2015	vibratory hammer	Other Construction Equipment	327	439	0.42	g/hp-hr	0.16263	0.14962	0.16263	4.41527	0.01006	1.7	0.26806	0.28227	536.21228	0.03046	0.01365
2015	pile hammer	Other Construction Equipment	327	439	0.42	g/hp-hr	0.16263	0.14962	0.16263	4.41527	0.01006	1.7	0.26806	0.28227	536.21228	0.03046	0.01365
2015	tractor	Tractors/Loaders/Backhoes	381	511	0.37	g/hp-hr	0.14910	0.13717	0.14910	4.34841	0.01000	1.7	0.25781	0.27148	532.74974	0.03026	0.01357
2015	welder	Other Construction Equipment	46	62	0.42	g/hp-hr	0.50336	0.46309	0.50336	5.56407	0.01119	5.2	1.08179	1.13913	596.39565	0.03388	0.01519
2015	aerial lift	Aerial Lifts	34	46	0.31	g/hp-hr	0.13602	0.12514	0.13602	3.93290	0.01111	5.2	0.20527	0.21615	592.03553	0.03363	0.01508
2015	*barge/scow auxiliary engines:*																
2015	barge/scow compressor	Other Construction Equipment		353	0.42	g/hp-hr	0.16263	0.14962	0.16263	4.41527	0.01006	1.7	0.26806	0.28227	536.21228	0.03046	0.01365
2015	barge/scow crane	Cranes		376	0.29	g/hp-hr	0.25337	0.23310	0.25337	6.12414	0.00998	2.2	0.39259	0.41340	532.05105	0.03022	0.01355
2015	barge/scow deck door engine	Other Construction Equipment		86	0.42	g/hp-hr	0.51185	0.47091	0.51185	6.53660	0.00996	7.6	0.59746	0.62913	530.98261	0.03016	0.01352
2015	barge/scow dredger	Other Construction Equipment		527	0.42	g/hp-hr	0.12313	0.11328	0.12313	3.83572	0.01001	0.9	0.20547	0.21636	533.32775	0.03030	0.01358
2015	barge/scow generator	Other Construction Equipment		464	0.42	g/hp-hr	0.16263	0.14962	0.16263	4.41527	0.01006	1.7	0.26806	0.28227	536.21228	0.03046	0.01365
2015	barge/scow hoist swing winch	Other Construction Equipment		379	0.42	g/hp-hr	0.16263	0.14962	0.16263	4.41527	0.01006	1.7	0.26806	0.28227	536.21228	0.03046	0.01365
2015	barge/scow hoist swing pump	Other Construction Equipment		517	0.42	g/hp-hr	0.12313	0.11328	0.12313	3.83572	0.01001	0.9	0.20547	0.21636	533.32775	0.03030	0.01358

Table B1.4 **Construction Offroad Engine Characteristics and Emission Factors**

			Emission Factors, Mitigated (Unloaded)										
Year	**Source Description**	**OFFROAD2011 Category**	**PM10**	**PM2.5**	**DPM**	**NOx**	**SOx**	**CO**	**HC**	**VOC**	**CO2**	**CH4**	**N2O**
2015													
2015	blade/grader	Graders	0.04300	0.04300	0.04300	2.58000	0.01010	3.46176		0.34465	538.22334	0.03057	0.01371
2015	crane	Cranes	0.04300	0.04300	0.04300	2.58000	0.00998	2.19918		0.41340	532.05105	0.03022	0.01355
2015	dozer	Rubber Tired Dozers	0.04300	0.04300	0.04300	2.58000	0.01014	3.46176		0.60455	540.32537	0.03069	0.01376
2015	excavator	Excavators	0.04300	0.04300	0.04300	2.58000	0.01000	3.46176		0.25122	532.94436	0.03027	0.01357
2015	forklift	Forklifts	0.04300	0.04300	0.04300	2.58000	0.01002	3.46176		0.49145	533.68728	0.03032	0.01359
2015	loader	Tractors/Loaders/Backhoes	0.04300	0.04300	0.04300	2.58000	0.01010	3.46176		0.49546	538.47071	0.03059	0.01371
2015	paving machine	Paving Equipment	0.04300	0.04300	0.04300	2.58000	0.01002	3.46176		0.57523	534.10140	0.03034	0.01360
2015	pneumatic lift	Other Construction Equipment	0.04300	0.04300	0.04300	2.58000	0.01119	3.46176		0.60455	596.39565	0.03388	0.01519
2015	prentice loader	Other Construction Equipment	0.04300	0.04300	0.04300	2.58000	0.00996	3.46176		0.60455	530.98261	0.03016	0.01352
2015	regulator	Other Construction Equipment	0.04300	0.04300	0.04300	2.58000	0.01006	1.65605		0.28227	536.21228	0.03046	0.01365
2015	roller	Rollers	0.04300	0.04300	0.04300	2.58000	0.01003	3.46176		0.59468	534.45320	0.03036	0.01361
2015	skip loader	Skid Steer Loaders	0.04300	0.04300	0.04300	2.58000	0.00999	3.46176		0.25573	532.46510	0.03025	0.01356
2015	slurry truck	Off-Highway Trucks	0.04300	0.04300	0.04300	2.58000	0.01005	1.85382		0.39308	535.63804	0.03043	0.01364
2015	speed swing	Other Construction Equipment	0.04300	0.04300	0.04300	2.58000	0.01006	1.65605		0.28227	536.21228	0.03046	0.01365
2015	striping truck	Other Construction Equipment	0.04300	0.04300	0.04300	2.58000	0.01119	3.46176		0.60455	596.39565	0.03388	0.01519
2015	sweeping truck	Off-Highway Trucks	0.04300	0.04300	0.04300	2.58000	0.01005	1.85382		0.39308	535.63804	0.03043	0.01364
2015	swivel dump	Other Construction Equipment	0.04300	0.04300	0.04300	2.58000	0.01006	1.65605		0.28227	536.21228	0.03046	0.01365
2015	tamper	Surfacing Equipment	0.04300	0.04300	0.04300	2.58000	0.00998	2.21205		0.15461	531.96628	0.03022	0.01355
2015	tie truck	Off-Highway Trucks	0.04300	0.04300	0.04300	2.58000	0.01005	1.85382		0.39308	535.63804	0.03043	0.01364
2015	jet pump	Other Construction Equipment	0.04300	0.04300	0.04300	2.58000	0.00996	3.46176		0.60455	530.98261	0.03016	0.01352
2015	scraper	Scrapers	0.04300	0.04300	0.04300	2.58000	0.01000	2.82769		0.41095	532.83159	0.03027	0.01357
2015	water truck	Off-Highway Trucks	0.04300	0.04300	0.04300	2.58000	0.01005	1.85382		0.39308	535.63804	0.03043	0.01364
2015	vibratory hammer	Other Construction Equipment	0.04300	0.04300	0.04300	2.58000	0.01006	1.65605		0.28227	536.21228	0.03046	0.01365
2015	pile hammer	Other Construction Equipment	0.04300	0.04300	0.04300	2.58000	0.01006	1.65605		0.28227	536.21228	0.03046	0.01365
2015	tractor	Tractors/Loaders/Backhoes	0.04300	0.04300	0.04300	2.58000	0.01000	1.74404		0.27148	532.74974	0.03026	0.01357
2015	welder	Other Construction Equipment	0.04300	0.04300	0.04300	2.58000	0.01119	3.46176		0.60455	596.39565	0.03388	0.01519
2015	aerial lift	Aerial Lifts	0.04300	0.04300	0.04300	2.58000	0.01111	3.46176		0.21615	592.03553	0.03363	0.01508
2015	*barge/scow auxiliary engines:*												
2015	barge/scow compressor	Other Construction Equipment	0.04300	0.04300	0.04300	2.58000	0.01006	1.65605		0.28227	536.21228	0.03046	0.01365
2015	barge/scow crane	Cranes	0.04300	0.04300	0.04300	2.58000	0.00998	2.19918		0.41340	532.05105	0.03022	0.01355
2015	barge/scow deck door engine	Other Construction Equipment	0.04300	0.04300	0.04300	2.58000	0.00996	3.46176		0.60455	530.98261	0.03016	0.01352
2015	barge/scow dredger	Other Construction Equipment	0.04300	0.04300	0.04300	2.58000	0.01001	0.86783		0.21636	533.32775	0.03030	0.01358
2015	barge/scow generator	Other Construction Equipment	0.04300	0.04300	0.04300	2.58000	0.01006	1.65605		0.28227	536.21228	0.03046	0.01365
2015	barge/scow hoist swing winch	Other Construction Equipment	0.04300	0.04300	0.04300	2.58000	0.01006	1.65605		0.28227	536.21228	0.03046	0.01365
2015	barge/scow hoist swing pump	Other Construction Equipment	0.04300	0.04300	0.04300	2.58000	0.01001	0.86783		0.21636	533.32775	0.03030	0.01358

Table B1.4 **Construction Offroad Engine Characteristics and Emission Factors**

Year	Source Description	OFFROAD2011 Category	Engine (kW)	Engine (Hp)	Load Factor	Emission Factor Units	Emission Factors, Unmitigated (unloaded) PM10	PM2.5	DPM	NOx	SOx	CO	HC	VOC	CO2	CH4	N2O
2016																	
2016	blade/grader	Graders	162	217	0.41	g/hp-hr	0.18397	0.16925	0.18397	5.66289	0.01010	5.0	0.32917	0.34662	538.08896	0.03057	0.01370
2016	crane	Cranes	208	279	0.29	g/hp-hr	0.23319	0.21453	0.23319	5.64875	0.00999	2.1	0.36608	0.38549	532.19203	0.03023	0.01355
2016	excavator	Excavators	157	211	0.38	g/hp-hr	0.11579	0.10653	0.11579	3.66742	0.01000	5.0	0.21669	0.22818	532.67134	0.03026	0.01356
2016	forklift	Forklifts	149	200	0.20	g/hp-hr	0.27986	0.25747	0.27986	6.35314	0.01002	5.0	0.44583	0.46946	533.68728	0.03032	0.01359
2016	loader	Tractors/Loaders/Backhoes	75	101	0.37	g/hp-hr	0.39593	0.36426	0.39593	5.14244	0.01009	8.2	0.44467	0.46824	537.72060	0.03055	0.01369
2016	paving machine	Paving Equipment	82	110	0.36	g/hp-hr	0.43832	0.40326	0.43832	5.73340	0.01002	10.0	0.51508	0.54238	534.10803	0.03034	0.01360
2016	pneumatic lift	Other Construction Equipment	34	46	0.42	g/hp-hr	0.49199	0.45263	0.49199	5.49931	0.01119	5.2	1.05837	1.11447	596.22269	0.03387	0.01518
2016	prentice loader	Tractors/Loaders/Backhoes	261	350	0.37	g/hp-hr	0.39593	0.36426	0.39593	5.14244	0.01009	8.2	0.44467	0.46824	537.72060	0.03055	0.01369
2016	regulator	Other Construction Equipment	168	225	0.42	g/hp-hr	0.15066	0.13860	0.15066	4.08979	0.01006	1.6	0.25417	0.26765	535.99663	0.03045	0.01365
2016	roller	Rollers	84	113	0.38	g/hp-hr	0.42752	0.39332	0.42752	5.80573	0.01003	8.7	0.51920	0.54671	534.41138	0.03036	0.01361
2016	skip loader	Skid Steer Loaders	75	101	0.37	g/hp-hr	0.19740	0.18161	0.19740	3.53445	0.00999	6.9	0.22574	0.23771	532.41174	0.03024	0.01356
2016	slurry truck	Off-Highway Trucks	381	511	0.38	g/hp-hr	0.18665	0.17172	0.18665	4.64255	0.01003	1.8	0.34542	0.36373	534.61426	0.03037	0.01361
2016	speed swing	Other Construction Equipment	327	439	0.42	g/hp-hr	0.15066	0.13860	0.15066	4.08979	0.01006	1.6	0.25417	0.26765	535.99663	0.03045	0.01365
2016	striping truck	Other Construction Equipment	4	5	0.42	g/hp-hr	0.49199	0.45263	0.49199	5.49931	0.01119	5.2	1.05837	1.11447	596.22269	0.03387	0.01518
2016	sweeping truck	Off-Highway Trucks	381	511	0.38	g/hp-hr	0.18665	0.17172	0.18665	4.64255	0.01003	1.8	0.34542	0.36373	534.61426	0.03037	0.01361
2016	swivel dump	Other Construction Equipment	327	439	0.42	g/hp-hr	0.15066	0.13860	0.15066	4.08979	0.01006	1.6	0.25417	0.26765	535.99663	0.03045	0.01365
2016	tamper	Surfacing Equipment	392	526	0.30	g/hp-hr	0.09264	0.08523	0.09264	2.87959	0.01000	2.1	0.13374	0.14083	533.11616	0.03028	0.01358
2016	tie truck	Off-Highway Trucks	381	511	0.38	g/hp-hr	0.18665	0.17172	0.18665	4.64255	0.01003	1.8	0.34542	0.36373	534.61426	0.03037	0.01361
2016	jet pump	Other Construction Equipment	84	113	0.42	g/hp-hr	0.49569	0.45604	0.49569	6.32543	0.00997	7.4	0.58129	0.61210	531.41467	0.03019	0.01353
2016	scraper	Scrapers	356	477	0.48	g/hp-hr	0.23207	0.21350	0.23207	5.75759	0.00999	2.7	0.37386	0.39367	532.46770	0.03025	0.01356
2016	water truck	Off-Highway Trucks	381	511	0.38	g/hp-hr	0.18665	0.17172	0.18665	4.64255	0.01003	1.8	0.34542	0.36373	534.61426	0.03037	0.01361
2016	vibratory hammer	Other Construction Equipment	327	439	0.42	g/hp-hr	0.15066	0.13860	0.15066	4.08979	0.01006	1.6	0.25417	0.26765	535.99663	0.03045	0.01365
2016	pile hammer	Other Construction Equipment	327	439	0.42	g/hp-hr	0.15066	0.13860	0.15066	4.08979	0.01006	1.6	0.25417	0.26765	535.99663	0.03045	0.01365
2016	tractor	Tractors/Loaders/Backhoes	381	511	0.37	g/hp-hr	0.13104	0.12055	0.13104	3.78666	0.00997	1.7	0.23458	0.24702	531.33141	0.03018	0.01353
2016	welder	Other Construction Equipment	46	62	0.42	g/hp-hr	0.49199	0.45263	0.49199	5.49931	0.01119	5.2	1.05837	1.11447	596.22269	0.03387	0.01518
2016	aerial lift	Aerial Lifts	34	46	0.31	g/hp-hr	0.10463	0.09626	0.10463	3.67578	0.01111	5.2	0.18827	0.19825	592.03553	0.03363	0.01508
2016	*barge/scow auxiliary engines:*																
2016	barge/scow compressor	Other Construction Equipment		353	0.42	g/hp-hr	0.15066	0.13860	0.15066	4.08979	0.01006	1.6	0.25417	0.26765	535.99663	0.03045	0.01365
2016	barge/scow crane	Cranes		376	0.29	g/hp-hr	0.23319	0.21453	0.23319	5.64875	0.00999	2.1	0.36608	0.38549	532.19203	0.03023	0.01355
2016	barge/scow deck door engine	Other Construction Equipment		86	0.42	g/hp-hr	0.49569	0.45604	0.49569	6.32543	0.00997	7.4	0.58129	0.61210	531.41467	0.03019	0.01353
2016	barge/scow dredger	Other Construction Equipment		527	0.42	g/hp-hr	0.12157	0.11184	0.12157	3.74629	0.01001	0.9	0.20673	0.21769	533.35408	0.03030	0.01358
2016	barge/scow generator	Other Construction Equipment		464	0.42	g/hp-hr	0.15066	0.13860	0.15066	4.08979	0.01006	1.6	0.25417	0.26765	535.99663	0.03045	0.01365
2016	barge/scow hoist swing winch	Other Construction Equipment		379	0.42	g/hp-hr	0.15066	0.13860	0.15066	4.08979	0.01006	1.6	0.25417	0.26765	535.99663	0.03045	0.01365
2016	barge/scow hoist swing pump	Other Construction Equipment		517	0.42	g/hp-hr	0.12157	0.11184	0.12157	3.74629	0.01001	0.9	0.20673	0.21769	533.35408	0.03030	0.01358

Notes and assumptions:
Offroad2011 categories are from EMFAC2011 Offroad Construction Equipment and Industrial Equipment module
HP and load factors for offroad equipment are from CalEEMod, Appendix D, Table 3.3.
Horsepower and load factors for barge/scow auxiliary engines are from OFFROAD2011 HC module.
Exceptions: horsepower for striping machine was obtained from online advertisement
CO is from Offroad2007 because Offroad2011 does not calculate CO.

Table B1.4 **Construction Offroad Engine Characteristics and Emission Factors**

			Emission Factors, Mitigated (Unloaded)										
Year	**Source Description**	**OFFROAD2011 Category**	**PM10**	**PM2.5**	**DPM**	**NOx**	**SOx**	**CO**	**HC**	**VOC**	**CO2**	**CH4**	**N2O**
2016													
2016	blade/grader	Graders	0.04300	0.04300	0.04300	2.58000	0.01010	3.46176		0.34662	538.08896	0.03057	0.01370
2016	crane	Cranes	0.04300	0.04300	0.04300	2.58000	0.00999	2.08937		0.38549	532.19203	0.03023	0.01355
2016	excavator	Excavators	0.04300	0.04300	0.04300	2.58000	0.01000	3.46176		0.22818	532.67134	0.03026	0.01356
2016	forklift	Forklifts	0.04300	0.04300	0.04300	2.58000	0.01002	3.46176		0.46946	533.68728	0.03032	0.01359
2016	loader	Tractors/Loaders/Backhoes	0.04300	0.04300	0.04300	2.58000	0.01009	3.46176		0.46824	537.72060	0.03055	0.01369
2016	paving machine	Paving Equipment	0.04300	0.04300	0.04300	2.58000	0.01002	3.46176		0.54238	534.10803	0.03034	0.01360
2016	pneumatic lift	Other Construction Equipment	0.04300	0.04300	0.04300	2.58000	0.01119	3.46176		0.60455	596.22269	0.03387	0.01518
2016	prentice loader	Tractors/Loaders/Backhoes	0.04300	0.04300	0.04300	2.58000	0.01009	3.46176		0.46824	537.72060	0.03055	0.01369
2016	regulator	Other Construction Equipment	0.04300	0.04300	0.04300	2.58000	0.01006	1.62446		0.26765	535.99663	0.03045	0.01365
2016	roller	Rollers	0.04300	0.04300	0.04300	2.58000	0.01003	3.46176		0.54671	534.41138	0.03036	0.01361
2016	skip loader	Skid Steer Loaders	0.04300	0.04300	0.04300	2.58000	0.00999	3.46176		0.23771	532.41174	0.03024	0.01356
2016	slurry truck	Off-Highway Trucks	0.04300	0.04300	0.04300	2.58000	0.01003	1.80585		0.36373	534.61426	0.03037	0.01361
2016	speed swing	Other Construction Equipment	0.04300	0.04300	0.04300	2.58000	0.01006	1.62446		0.26765	535.99663	0.03045	0.01365
2016	striping truck	Other Construction Equipment	0.04300	0.04300	0.04300	2.58000	0.01119	3.46176		0.60455	596.22269	0.03387	0.01518
2016	sweeping truck	Off-Highway Trucks	0.04300	0.04300	0.04300	2.58000	0.01003	1.80585		0.36373	534.61426	0.03037	0.01361
2016	swivel dump	Other Construction Equipment	0.04300	0.04300	0.04300	2.58000	0.01006	1.62446		0.26765	535.99663	0.03045	0.01365
2016	tamper	Surfacing Equipment	0.04300	0.04300	0.04300	2.58000	0.01000	2.10630		0.14083	533.11616	0.03028	0.01358
2016	tie truck	Off-Highway Trucks	0.04300	0.04300	0.04300	2.58000	0.01003	1.80585		0.36373	534.61426	0.03037	0.01361
2016	jet pump	Other Construction Equipment	0.04300	0.04300	0.04300	2.58000	0.00997	3.46176		0.60455	531.41467	0.03019	0.01353
2016	scraper	Scrapers	0.04300	0.04300	0.04300	2.58000	0.00999	2.67307		0.39367	532.46770	0.03025	0.01356
2016	water truck	Off-Highway Trucks	0.04300	0.04300	0.04300	2.58000	0.01003	1.80585		0.36373	534.61426	0.03037	0.01361
2016	vibratory hammer	Other Construction Equipment	0.04300	0.04300	0.04300	2.58000	0.01006	1.62446		0.26765	535.99663	0.03045	0.01365
2016	pile hammer	Other Construction Equipment	0.04300	0.04300	0.04300	2.58000	0.01006	1.62446		0.26765	535.99663	0.03045	0.01365
2016	tractor	Tractors/Loaders/Backhoes	0.04300	0.04300	0.04300	2.58000	0.00997	1.71311		0.24702	531.33141	0.03018	0.01353
2016	welder	Other Construction Equipment	0.04300	0.04300	0.04300	2.58000	0.01119	3.46176		0.60455	596.22269	0.03387	0.01518
2016	aerial lift	Aerial Lifts	0.04300	0.04300	0.04300	2.58000	0.01111	3.46176		0.19825	592.03553	0.03363	0.01508
2016	*barge/scow auxiliary engines:*												
2016	barge/scow compressor	Other Construction Equipment	0.04300	0.04300	0.04300	2.58000	0.01006	1.62446		0.26765	535.99663	0.03045	0.01365
2016	barge/scow crane	Cranes	0.04300	0.04300	0.04300	2.58000	0.00999	2.08937		0.38549	532.19203	0.03023	0.01355
2016	barge/scow deck door engine	Other Construction Equipment	0.04300	0.04300	0.04300	2.58000	0.00997	3.46176		0.60455	531.41467	0.03019	0.01353
2016	barge/scow dredger	Other Construction Equipment	0.04300	0.04300	0.04300	2.58000	0.01001	0.85128		0.21769	533.35408	0.03030	0.01358
2016	barge/scow generator	Other Construction Equipment	0.04300	0.04300	0.04300	2.58000	0.01006	1.62446		0.26765	535.99663	0.03045	0.01365
2016	barge/scow hoist swing winch	Other Construction Equipment	0.04300	0.04300	0.04300	2.58000	0.01006	1.62446		0.26765	535.99663	0.03045	0.01365
2016	barge/scow hoist swing pump	Other Construction Equipment	0.04300	0.04300	0.04300	2.58000	0.01001	0.85128		0.21769	533.35408	0.03030	0.01358

Notes and assumptions:
Offroad2011 categories are from EMFAC2011 Offroad Construction Equipment and Industrial Equipment module
HP and load factors for offroad equipment are from CalEEMod, Appendix D, Table 3.3.
Horsepower and load factors for barge/scow auxiliary engines are from OFFROAD2011 HC module.
Exceptions: horsepower for striping machine was obtained from online advertisement
CO is from Offroad2007 because Offroad2011 does not calculate CO.

Table B1.5 **Offroad2011 Load Factors**

EquipmentTypeID	Adj ARB LF
A/C Tug Narrow Body	0.536
A/C Tug Wide Body	0.536
Baggage Tug	0.3685
Belt Loader	0.335
Bobtail	0.3685
Cargo Loader	0.335
Cargo Tractor	0.3618
Forklift (GSE)	0.201
Lift (GSE)	0.335
Other GSE	0.335
Bore/Drill Rigs	0.5025
Cranes	0.2881
Crawler Tractors	0.4288
Excavators	0.3819
Graders	0.4087
Off-Highway Tractors	0.4355
Off-Highway Trucks	0.3819
Other Construction Equipment	0.4154
Pavers	0.4154
Paving Equipment	0.3551
Rollers	0.3752
Rough Terrain Forklifts	0.402
Rubber Tired Dozers	0.3953
Rubber Tired Loaders	0.3618
Scrapers	0.4824
Skid Steer Loaders	0.3685
Surfacing Equipment	0.3015
Tractors/Loaders/Backhoes	0.3685
Trenchers	0.5025
Aerial Lifts	0.3082
Forklifts	0.201
Other General Industrial Equipment	0.3417
Other Material Handling Equipment	0.3953
Drill Rig (Mobile)	0.5025
Workover Rig (Mobile)	0.5025
Sweepers/Scrubbers	0.4556
Passenger Stand	0.3953

Table B1.6 **LAHD Sustainable Construction Guidelines Table A: Comp** (g/bhp-hr)

Compliance Alternative		Engine Standard	CARB-Verified DECS	2015+	PM	Nox	CO	VOC
	1	Tier 4	N/A	50%	0.01	0.3	2.55	0.15
	2	Tier 3	Level 3	20%	0.02	2.9	2.71	0.56
	3	Tier 2	Level 3		0.02	4.7	2.71	2.19
	4	Tier 1	Level 3	10%	0.06	6.9	6.87	0.99
	5	Tier 2	Level 2	10%	0.08	4.7	2.71	2.19
	6	Tier 2	Level 1		0.11	4.7	2.71	2.19
	7	Tier 2	Uncontrolled		0.15	4.7	2.71	2.19
	8	Tier 1	Level 2	10%	0.2	6.9	6.87	0.99
2015+ Composite Emission Factor					**0.043**	**2.58**	**3.5**	**0.6**

Table B1.7 Construction Onroad Engine Characteristics and Emission Factors

		Emission Factors, Unmitigated Average														
		PM10 brake wear	PM10 tire wear	PM2.5 brake wear	PM2.5 tire wear	PM10	PM2.5	DPM	NOx	SOx	CO	HC	VOC	CO2	CH4	N2O
2015 *Idling Exhaust Onsite*																
bobtail truck T6 instate construction heavy	g/hr-vehicle	0	0	0	0	0.337314	0.3103289	0.337314	80.186509	0.0715001	22.033837		1.9698024	7307.0452	0	0
flatbed trailc T6 instate construction heavy	g/hr-vehicle	0	0	0	0	0.337314	0.3103289	0.337314	80.186509	0.0715001	22.033837		1.9698024	7307.0452	0	0
haul trucks T6 instate construction heavy	g/hr-vehicle	0	0	0	0	0.337314	0.3103289	0.337314	80.186509	0.0715001	22.033837		1.9698024	7307.0452	0	0
material deli T6 instate construction heavy	g/hr-vehicle	0	0	0	0	0.337314	0.3103289	0.337314	80.186509	0.0715001	22.033837		1.9698024	7307.0452	0	0
pick-up truc LDT2	g/hr-vehicle															
worker vehi LDA	g/hr-vehicle															
2015 *Transit Exhaust Onsite*																
bobtail truck T6 instate construction heavy	g/mile	0	0	0	0	0.3086019	0.2839138	0.3086019	20.308176	0	2.4465648		1.6431981	2545.7776	0	0
flatbed trailc T6 instate construction heavy	g/mile	0	0	0	0	0.3086019	0.2839138	0.3086019	20.308176	0	2.4465648		1.6431981	2545.7776	0	0
haul trucks T6 instate construction heavy	g/mile	0	0	0	0	0.3086019	0.2839138	0.3086019	20.308176	0	2.4465648		1.6431981	2545.7776	0	0
material deli T6 instate construction heavy	g/mile	0	0	0	0	0.3086019	0.2839138	0.3086019	20.308176	0	2.4465648		1.6431981	2545.7776	0	0
pick-up truc LDT2	g/mile	0	0	0	0	0.1214561	0.1117396	0.1214561	0.9438616	0	1.0334394		0.1521778	386.36591	0	0
worker vehi LDA	g/mile	0	0	0	0	0.0108168	0.0099379	0.0108168	0.1780533	0	2.4092613		0.1717998	945.27011	0	0
2015 *Transit Exhaust Offsite*																
bobtail truck T6 instate construction heavy	g/mile	0.13034	0.012	0.05586	0.003	0.0738049	0.0679005	0.0738049	6.6745717	0.010913	0.49954		0.1215765	1115.2628	0	0
flatbed trailc T6 instate construction heavy	g/mile	0.13034	0.012	0.05586	0.003	0.0738049	0.0679005	0.0738049	6.6745717	0.010913	0.49954		0.1215765	1115.2628	0	0
haul trucks T6 instate construction heavy	g/mile	0.13034	0.012	0.05586	0.003	0.0738049	0.0679005	0.0738049	6.6745717	0.010913	0.49954		0.1215765	1115.2628	0	0
material deli T6 instate construction heavy	g/mile	0.13034	0.012	0.05586	0.003	0.0738049	0.0679005	0.0738049	6.6745717	0.010913	0.49954		0.1215765	1115.2628	0	0
pick-up truc LDT2	g/mile	0.03675	0.008	0.01575	0.002	0.0025725	0.0023611	0.0025725	0.259778	0.0050955	2.3288254		0.2375715	454.71457	0	0
worker vehi LDA	g/mile	0.03675	0.008	0.01575	0.002	0.0024763	0.002265	0.0024763	0.1383158	0.0037545	1.6735154		0.1813203	320.37078	0	0
2016 *Idling Exhaust Onsite*																
bobtail truck T6 instate construction heavy	g/hr-vehicle	0	0	0	0	0.276904	0.2547516	0.276904	75.252988	0.0718999	21.894273		1.9162029	7272.5331	0	0
flatbed trailc T6 instate construction heavy	g/hr-vehicle	0	0	0	0	0.276904	0.2547516	0.276904	75.252988	0.0718999	21.894273		1.9162029	7272.5331	0	0
haul trucks T6 instate construction heavy	g/hr-vehicle	0	0	0	0	0.276904	0.2547516	0.276904	75.252988	0.0718999	21.894273		1.9162029	7272.5331	0	0
material deli T6 instate construction heavy	g/hr-vehicle	0	0	0	0	0.276904	0.2547516	0.276904	75.252988	0.0718999	21.894273		1.9162029	7272.5331	0	0
pick-up truc LDT2	g/hr-vehicle															
worker vehi LDA	g/hr-vehicle															
2016 *Transit Exhaust Onsite*																
bobtail truck T6 instate construction heavy	g/mile	0	0	0	0	0.187414	0.1724208	0.187414	18.006635	0	2.0992087		1.3260276	2517.0611	0	0
flatbed trailc T6 instate construction heavy	g/mile	0	0	0	0	0.187414	0.1724208	0.187414	18.006635	0	2.0992087		1.3260276	2517.0611	0	0
haul trucks T6 instate construction heavy	g/mile	0	0	0	0	0.187414	0.1724208	0.187414	18.006635	0	2.0992087		1.3260276	2517.0611	0	0
material deli T6 instate construction heavy	g/mile	0	0	0	0	0.187414	0.1724208	0.187414	18.006635	0	2.0992087		1.3260276	2517.0611	0	0
pick-up truc LDT2	g/mile	0	0	0	0	0.10029	0.0922668	0.10029	0.8440851	0	0.8797248		0.1259299	381.16624	0	0
worker vehi LDA	g/mile	0	0	0	0	0.0105309	0.0096978	0.0105309	0.1620182	0	2.1336324		0.1478416	908.46905	0	0
2016 *Transit Exhaust Offsite*																
bobtail truck T6 instate construction heavy	g/mile	0.13034	0.012	0.05586	0.003	0.0580021	0.0533619	0.0580021	5.9058158	0.0109024	0.4309046		0.1008201	1102.7602	0	0
flatbed trailc T6 instate construction heavy	g/mile	0.13034	0.012	0.05586	0.003	0.0580021	0.0533619	0.0580021	5.9058158	0.0109024	0.4309046		0.1008201	1102.7602	0	0
haul trucks T6 instate construction heavy	g/mile	0.13034	0.012	0.05586	0.003	0.0580021	0.0533619	0.0580021	5.9058158	0.0109024	0.4309046		0.1008201	1102.7602	0	0
material deli T6 instate construction heavy	g/mile	0.13034	0.012	0.05586	0.003	0.0580021	0.0533619	0.0580021	5.9058158	0.0109024	0.4309046		0.1008201	1102.7602	0	0
pick-up truc LDT2	g/mile	0.03675	0.008	0.01575	0.002	0.0024904	0.0022914	0.0024904	0.2300656	0.00509	2.0961014		0.2184972	441.00857	0	0
worker vehi LDA	g/mile	0.03675	0.008	0.01575	0.002	0.0024072	0.0022093	0.0024072	0.1238718	0.0037527	1.4993803		0.1613263	307.82333	0	0

Table B1.7 Construction Onroad Engine Characteristics and Emission Factors

			Emission Factors, Mitigated Average														
			PM10 brake wear	PM10 tire wear	PM2.5 brake wear	PM2.5 tire wear	PM10	PM2.5	DPM	NOx	SOx	CO	HC	VOC	CO2	CH4	N2O
2015	*Idling Exhaust Onsite*																
	bobtail truck T6 instate construction heavy	g/hr-vehicle	0	0	0	0	0.0902737	0.0830518	0.0902737	38.408956	0.0728751	25.423013		2.1499258	7447.5574	0	0
	flatbed trailc T6 instate construction heavy	g/hr-vehicle	0	0	0	0	0.0902737	0.0830518	0.0902737	38.408956	0.0728751	25.423013		2.1499258	7447.5574	0	0
	haul trucks T6 instate construction heavy	g/hr-vehicle	0	0	0	0	0.0902737	0.0830518	0.0902737	38.408956	0.0728751	25.423013		2.1499258	7447.5574	0	0
	material deli T6 instate construction heavy	g/hr-vehicle	0	0	0	0	0.0902737	0.0830518	0.0902737	38.408956	0.0728751	25.423013		2.1499258	7447.5574	0	0
	pick-up truc LDT2	g/hr-vehicle															
	worker vehi LDA	g/hr-vehicle															
2015	*Transit Exhaust Onsite*																
	bobtail truck T6 instate construction heavy	g/mile	0	0	0	0	0.0399314	0.0367369	0.0399314	5.9294374	0	2.3254946		1.3114062	2525.156	0	0
	flatbed trailc T6 instate construction heavy	g/mile	0	0	0	0	0.0399314	0.0367369	0.0399314	5.9294374	0	2.3254946		1.3114062	2525.156	0	0
	haul trucks T6 instate construction heavy	g/mile	0	0	0	0	0.0399314	0.0367369	0.0399314	5.9294374	0	2.3254946		1.3114062	2525.156	0	0
	material deli T6 instate construction heavy	g/mile	0	0	0	0	0.0399314	0.0367369	0.0399314	5.9294374	0	2.3254946		1.3114062	2525.156	0	0
	pick-up truc LDT2	g/mile															
	worker vehi LDA	g/mile															
2015	*Transit Exhaust Offsite*																
	bobtail truck T6 instate construction heavy	g/mile	0.13034	0.012	0.05586	0.003	0.0407941	0.0375306	0.0407941	1.7949291	0.0107896	0.4833215		0.1054755	1102.6516	0	0
	flatbed trailc T6 instate construction heavy	g/mile	0.13034	0.012	0.05586	0.003	0.0407941	0.0375306	0.0407941	1.7949291	0.0107896	0.4833215		0.1054755	1102.6516	0	0
	haul trucks T6 instate construction heavy	g/mile	0.13034	0.012	0.05586	0.003	0.0407941	0.0375306	0.0407941	1.7949291	0.0107896	0.4833215		0.1054755	1102.6516	0	0
	material deli T6 instate construction heavy	g/mile	0.13034	0.012	0.05586	0.003	0.0407941	0.0375306	0.0407941	1.7949291	0.0107896	0.4833215		0.1054755	1102.6516	0	0
	pick-up truc LDT2	g/mile															
	worker vehi LDA	g/mile															
2016	*Idling Exhaust Onsite*																
	bobtail truck T6 instate construction heavy	g/hr-vehicle	0	0	0	0	0.0902737	0.0830518	0.0902737	38.408956	0.0728751	25.423013		2.1499258	7371.1721	0	0
	flatbed trailc T6 instate construction heavy	g/hr-vehicle	0	0	0	0	0.0902737	0.0830518	0.0902737	38.408956	0.0728751	25.423013		2.1499258	7371.1721	0	0
	haul trucks T6 instate construction heavy	g/hr-vehicle	0	0	0	0	0.0902737	0.0830518	0.0902737	38.408956	0.0728751	25.423013		2.1499258	7371.1721	0	0
	material deli T6 instate construction heavy	g/hr-vehicle	0	0	0	0	0.0902737	0.0830518	0.0902737	38.408956	0.0728751	25.423013		2.1499258	7371.1721	0	0
	pick-up truc LDT2	g/hr-vehicle															
	worker vehi LDA	g/hr-vehicle															
2016	*Transit Exhaust Onsite*																
	bobtail truck T6 instate construction heavy	g/mile	0	0	0	0	0.0412094	0.0379127	0.0412094	5.7969048	0	2.3645325		1.3334207	2496.6121	0	0
	flatbed trailc T6 instate construction heavy	g/mile	0	0	0	0	0.0412094	0.0379127	0.0412094	5.7969048	0	2.3645325		1.3334207	2496.6121	0	0
	haul trucks T6 instate construction heavy	g/mile	0	0	0	0	0.0412094	0.0379127	0.0412094	5.7969048	0	2.3645325		1.3334207	2496.6121	0	0
	material deli T6 instate construction heavy	g/mile	0	0	0	0	0.0412094	0.0379127	0.0412094	5.7969048	0	2.3645325		1.3334207	2496.6121	0	0
	pick-up truc LDT2	g/mile															
	worker vehi LDA	g/mile															
2016	*Transit Exhaust Offsite*																
	bobtail truck T6 instate construction heavy	g/mile	0.13034	0.012	0.05586	0.003	0.0425351	0.0391323	0.0425351	1.7879376	0.0107844	0.4960747		0.1081131	1090.8212	0	0
	flatbed trailc T6 instate construction heavy	g/mile	0.13034	0.012	0.05586	0.003	0.0425351	0.0391323	0.0425351	1.7879376	0.0107844	0.4960747		0.1081131	1090.8212	0	0
	haul trucks T6 instate construction heavy	g/mile	0.13034	0.012	0.05586	0.003	0.0425351	0.0391323	0.0425351	1.7879376	0.0107844	0.4960747		0.1081131	1090.8212	0	0
	material deli T6 instate construction heavy	g/mile	0.13034	0.012	0.05586	0.003	0.0425351	0.0391323	0.0425351	1.7879376	0.0107844	0.4960747		0.1081131	1090.8212	0	0
	pick-up truc LDT2	g/mile															
	worker vehi LDA	g/mile															

Table B1.8 **Paved Road Dust Emission Factors**

Emission Source	(sL) Silt Loading (g/m2)	(k) Particle Size Multiplier - PM10 (g/VMT)	(k) Particle Size Multiplier - PM2.5 (g/VMT)	(W) Average Vehicle Weight on Road (tons)	(E) Uncontrolled PM10 Emission Factor (g/VMT)	(E) Uncontrolled PM2.5 Emission Factor (g/VMT)
Onsite Trucks	0.6	1.00	0.25	20.0	**13.34**	**3.34**
Offsite Autos	0.6	1.00	0.25	2.4	**1.53**	**0.38**
Offsite Roadway (all vehicles) <500 ADT	0.6	1.00	0.25	2.4	1.53	0.38
Offsite Roadway (all vehicles) 500-5000 ADT	0.2	1.00	0.25	2.4	0.56	0.14
Offsite Roadway (all vehicles) 5000-10000 ADT	0.06	1.00	0.25	2.4	**0.19**	**0.05**
Offsite Roadway (all vehicles) >10000 ADT	0.03	1.00	0.25	2.4	0.10	0.03
Offsite Roadway (all vehicles) >10000 ADT Limited Access	0.015	1.00	0.25	2.4	0.05	0.01

Notes:

1. Emission factors are calculated using Equation 1 of AP-42 Section 13.2.1 (Jan 2011). Because the emissions are primarily used for peak day or peak hour calculations, the downward adjustment due to annual precipitation (in Equation 2) was not made.
2. Emission factors exclude engine exhaust, tire wear, and brake wear.
3. The equation is: E = k (sL)^0.91 x (W)^1.02

Table B1.9 **Summary of Daily VMT by Roadway Type**

Los Angeles - Long Beach - Santa Ana Metro Area

Metropolitan Area	Interstate/ Other Fwy/ Exprwy	Other Principal Arterial	Minor Arterial	Collector	Local
Daily Vehicle-Miles Travelled (Thousands)	132,168	69,417	48,441	11,845	13,794
Travel Fraction	0.48	0.25	0.18	0.04	0.05

Source: Federal Highway Adminstration. Highway Statistics 2008 - Urbanized Areas - 2008 Miles and Daily Vehicle Miles Traveled. Table HM-71. October 2009. website: http://www.fhwa.dot.gov/policyinformation/statistics/2008/hm71.cfm.

Table B1.10 **Composite Paved Road Dust Emission Factors for Project Trips**

Road Type	Fraction of Travel by Roadway Type					Composite EF	
	Interstate/ Other Fwy/ Exprwy	Other Principal Arterial	Minor Arterial	Collector	Local	PM10 (g/VMT)	PM2.5 (g/VMT)
Vehicle Trips in Los Angeles - Long Beach - Santa Ana Metro Area	0.48	0.25	0.18	0.04	0.05	0.19	0.05

Table B1.11	Grading Dust Emission Factors		
PM10 (lb/VMT)	1.543	PM10 (lb/acre)	1.06
PM2.5 (lb/VMT)	0.167	PM2.5 (lb/acre)	0.11
E (lb/VMT) = k x 0.051 x (S)2.0 for PM10 and k x 0.040 x (S)2.5 for PM2.5			
k = Scaling Constant (0.60 for PM10 and 0.031 for PM2.5)			
S = Mean Vehicle Speed assumed to be 7.1 mph			
Assumes VMT = 3 x hours in use			
E = EF * VMT			
VMT = Acres graded / Wb * 43560(sft/acre) / 5280(ft/mile)		0.6875	VMT/acre
Wb = blade width of grading equipment = 12 ft			
Source: AP42 11.9 & CalEEMod			

Table B1.12	Material Loading/Handling Dust Emision Factors
PM10 (lb/ton)	0.0000888
PM2.5 (lb/ton)	0.0000134
EF = (k)(0.0032)[(U/5)1.3]/[(M/2)1.4]	
EF = lb/ton	
k = Particle Size Constant (0.35 for PM10 and 0.053 for PM2.5)	
U = average wind speed = 2.2 m/s (CalEEMod), 4.9 mph	
M = moisture content = 12% (CalEEMod)	
Source: AP-42, p. 13.2.4 & CalEEMod	
Soil density (ton/cyd):	1.26
Truck capacity (cyd)	20
Truck capacity (ton)	25.28

Table B1.13	Asphalt Paving
VOC (lb/acre)	2.62

Source: CalEEMod, Appendix A, Section 4.8.

Table B1.14 Construction Marine Engine Characteristics and Emission Factors

			HC Characteristics					Unmitigated Emission Factors										
Year	**HC Classification**	**Engine Type**	**Engine Count per HC**	**Average Model Year**	**HC Average Power (hp)**	**HC Average Power (kW)**	**Load Factor**	**Engine Tier**	PM10 (g/kW-hr)	PM2.5 (g/kW-hr)	DPM (g/kW-hr)	NOX (g/kW-hr)	SOX (g/kW-hr)	CO (g/kW-hr)	VOC (g/kW-hr)	CO2 (g/kW-hr)	CH4 (g/kW-hr)	N2O (g/kW-hr)
2015	Assist Tugboat	Propulsion	2	2004	2,046	1,526	0.31	Tier 1	0.54	0.48	0.54	17.00	0.01	11.40	1.37	652	0.03	0.03
		Auxiliary	1	2007	185	138	0.43	Tier 2	0.30	0.27	0.30	6.27	0.01	5.00	0.35	652	0.01	0.03
	Dive Boat	Propulsion	2	2001	496	370	0.38	Tier 1	0.54	0.48	0.54	17.00	0.01	11.40	1.37	652	0.03	0.03
		Auxiliary	1	1989	74	55	0.32	Tier 3	0.30	0.27	0.30	7.13	0.01	5.00	0.39	652	0.01	0.03
	Tugboat	Propulsion	2	2006	678	506	0.31	Tier 1	0.54	0.48	0.54	17.00	0.01	11.40	1.37	652	0.03	0.03
		Auxiliary	1	2007	45	34	0.43	Tier 2	0.30	0.27	0.30	6.27	0.01	5.00	0.35	652	0.01	0.03
	Crane Delivery Ship																	
	Crane Delivery Ship	Propulsion	1			12,798	Note [1]	Note [1]	1.50	1.20	1.50	18.10	10.50	1.40	0.63	620	0.01	0.03
	Crane Delivery Ship	Auxiliary	1			1,776	Note [1]	Note [1]	1.50	1.20	1.50	14.70	12.30	1.10	0.42	683	0.08	0.03
	Crane Delivery Ship	Boiler	1			371	Note [1]	Note [1]	0.80	0.64	0	2.10	16.50	0.20	0.11	970	0.00	0.08

Source:

HC average hp and engine count: 2011 POLA Emissions Inventory, Tables 4.1 and 4.2.

HC load factor: 2011 POLA Emissions Inventory, Table 4.6.

Note [1]. Crane delivery ship emissions were calculated using the OGV methodology used in operational calculations. Load factors for the propulsion engine vary depending on speed in each geographical zone between the Harbor and 100 nautical miles. Load factors for the auxiliary engine vary with energy demand while in transit, maneuvering or at berth.

Emission factors do not change between project alternatives.

Table B1.14 Construction Marine Engine Characteristi

			Mitigated Emission Factors											
Year	**HC Classification**	**Engine Type**	**Engine Tier**	PM10 (g/kW-hr)	PM2.5 (g/kW-hr)	DPM (g/kW-hr)	NOX (g/kW-hr)	SOX (g/kW-hr)	CO (g/kW-hr)	VOC (g/kW-hr)	CO2 (g/kW-hr)	CH4 (g/kW-hr)	N2O (g/kW-hr)
2015	Assist Tugboat	Propulsion	Tier 3	0.34	0.30	0.34	10.45	0.01	5.00	0.58	652	0.01	0.03
		Auxiliary	Tier 3	0.12	0.11	0.12	5.28	0.01	5.00	0.29	652.00	0.01	0.03
	Dive Boat	Propulsion	Tier 3	0.23	0.21	0.23	7.94	0.01	5.00	0.44	652.00	0.01	0.03
		Auxiliary	Tier 3	0.35	0.31	0.35	7.13	0.01	5.00	0.39	652.00	0.01	0.03
	Tugboat	Propulsion	Tier 3	0.23	0.21	0.23	7.94	0.01	5.00	0.44	652.00	0.01	0.03
		Auxiliary	Tier 3	0.18	0.16	0.18	5.81	0.01	5.00	0.32	652.00	0.01	0.03
	Crane Delivery Ship												
	Crane Delivery Ship	Propulsion	Note [1]	1.50	1.20	1.50	18.10	10.50	1.40	0.63	620	0.01	0.03
	Crane Delivery Ship	Auxiliary	Note [1]	1.50	1.20	1.50	14.70	12.30	1.10	0.42	683	0.08	0.03
	Crane Delivery Ship	Boiler	Note [1]	0.80	0.64	0	2.10	16.50	0.20	0.11	970	0.00	0.08

Source:

HC average hp and engine count: 2011 POLA Emissions Inventory

HC load factor: 2011 POLA Emissions Inventory, Table 4.6.

Note [1]. Crane delivery ship emissions were calculated using the
the auxiliary engine vary with energy demand while in transit, man

Emission factors do not change between project alternatives.

Table B1.15 Harbor Craft Tier Designation

Model Year	HP Range	kW Range	Tier
<1999			Tier 0
2000-2003	<750	<560	Tier 1
2000-2006	>750	>560	Tier 1
>2004	<750	<560	Tier 2
>2007	>750	>560	Tier 2
>2009	25-120	18-90	Tier 3

Source: POLA 2012 Emissions Inventory

Table B1.16 Harbor Craft Emission Factors - EPA Standards

					g/kw-hr										
Engine Displacement	**(kW)**	**EPA Tier**	**MY**	**CARB Compliance Year**	**MHC+NOx**	**PM10**	**PM2.5**	**DPM**	**NOx**	**SOX**	**CO**	**HC**	**VOC**	**CO2**	**CH4**	**N2O**
Category 1	HC auxiliary engines															
		Tier 1	2004			**0.54**	0.48	0.54	**17.00**	0.006	**11.40**	**1.30**	1.37	652	0.026	0.031
<0.9	37-75	Tier 2	2005		**7.50**	**0.40**	0.36	0.40	7.1	0.006	**5.00**	0.38	0.39	652	0.008	0.031
0.9 < displ < 1.2	75-130	Tier 2	2004		**7.20**	**0.30**	0.27	0.30	6.3	0.006	**5.00**	0.33	0.35	652	0.007	0.031
1.2 < displ < 2.5	130-560	Tier 2	2004		**7.20**	**0.30**	0.27	0.30	6.3	0.006	**5.00**	0.33	0.35	652	0.007	0.031
2.5 < displ < 5	>560	Tier 2	2007		**7.20**	**0.20**	0.18	0.20	6.1	0.006	**5.00**	0.32	0.34	652	0.006	0.031
<0.9	<19	Tier 3	2009		**7.5**	**0.40**	0.36	0.40	7.1	0.006	5.00	0.38	0.39	652	0.008	0.031
<0.9	19-75	Tier 3	2009		**7.5**	**0.30**	0.27	0.30	7.1	0.006	5.00	0.38	0.39	652	0.008	0.031
<0.9	75-3700	Tier 3	2012		**5.4**	**0.14**	0.12	0.14	5.1	0.006	5.00	0.27	0.28	652	0.005	0.031
0.9 < displ < 1.2	100-175	Tier 3	2013		**5.4**	**0.12**	0.11	0.12	5.1	0.006	5.00	0.27	0.28	652	0.005	0.031
1.2 < displ < 2.5	175-750	Tier 3	2014		**5.6**	**0.11**	0.10	0.11	5.3	0.006	5.00	0.28	0.29	652	0.006	0.031
2.5 < displ < 5	>750	Tier 3	2013		**5.6**	**0.11**	0.10	0.11	5.3	0.006	5.00	0.28	0.29	652	0.006	0.031
3.5 ≤ D < 7		Tier 3	2012		**5.8**	**0.11**	0.10	0.11	5.5	0.006	5.00	0.29	0.31	652	0.006	0.031
	>3700	Tier 4	2014			**0.12**	0.11	0.12	**1.8**	0.006	5.00	**0.19**	0.20	652	0.004	0.031
	2000-3700	Tier 4	2014			**0.04**	0.04	0.04	**1.8**	0.006	5.00	**0.19**	0.20	652	0.004	0.031
	1400-2000	Tier 4	2016			**0.04**	0.04	0.04	**1.8**	0.006	5.00	**0.19**	0.20	652	0.004	0.031
	600-1400	Tier 4	2017			**0.04**	0.04	0.04	**1.8**	0.006	5.00	**0.19**	0.20	652	0.004	0.031
Category 2	HC propulsion engines															
			MY													
>2.5	>37	Tier 1	2004			**0.54**	0.48	0.54	**17.00**	0.006	**11.40**	**1.30**	1.37	652	0.026	0.031
5.0 ≤ D < 15	all	Tier 2	2007		**7.8**	**0.27**	0.24	0.27	7.4	0.006	**5.00**	0.39	0.41	652	0.008	0.031
15 ≤ D < 20	< 3300 kW	Tier 2	2007		**8.7**	**0.50**	0.45	0.50	8.3	0.006	**5.00**	0.44	0.46	652	0.009	0.031
15 ≤ D < 20	≥ 3300 kW	Tier 2	2007		**9.8**	**0.50**	0.45	0.50	9.3	0.006	**5.00**	0.49	0.52	652	0.010	0.031
20 ≤ D < 25	all	Tier 2	2007		**9.8**	**0.50**	0.45	0.50	9.3	0.006	**5.00**	0.49	0.52	652	0.010	0.031
25 ≤ D < 30	all	Tier 2	2007		**11.0**	**0.50**	0.45	0.50	10.5	0.006	**5.00**	0.55	0.58	652	0.011	0.031
7 ≤ D < 15	<2000	Tier 3	2013		**6.2**	**0.14**	0.12	0.14	5.9	0.006	**5.00**	0.31	0.33	652	0.006	0.031
7 ≤ D < 15	2000-3700	Tier 3	2013		**7.8**	**0.14**	0.12	0.14	7.4	0.006	**5.00**	0.39	0.41	652	0.008	0.031
15 ≤ D < 20	<2000	Tier 3	2014		**7.0**	**0.34**	0.30	0.34	6.7	0.006	**5.00**	0.35	0.37	652	0.007	0.031
20 ≤ D < 25	<2000	Tier 3	2014		**9.8**	**0.27**	0.24	0.27	9.3	0.006	**5.00**	0.49	0.52	652	0.010	0.031
25 ≤ D < 30	<2000	Tier 3	2014		**11.0**	**0.27**	0.24	0.27	10.5	0.006	**5.00**	0.55	0.58	652	0.011	0.031
all	2000-3700	Tier 4	2014			**0.04**	0.04	0.04	**1.8**	0.006	5.00	**0.19**	0.20	652	0.004	0.031
<15	>3700	Tier 4	2014			**0.12**	0.11	0.12	**1.8**	0.006	5.00	**0.19**	0.20	652	0.004	0.031
15 ≤ D < 30	>3700	Tier 4	2014			**0.25**	0.22	0.25	**1.8**	0.006	5.00	**0.19**	0.20	652	0.004	0.031
all	>3700	Tier 4	2016			**0.06**	0.05	0.06	**1.8**	0.006	5.00	**0.19**	0.20	652	0.004	0.031
all	1400-2000	Tier 4	2016			**0.04**	0.04	0.04	**1.8**	0.006	5.00	**0.19**	0.20	652	0.004	0.031
all	600-1400	Tier 4	2017			**0.04**	0.04	0.04	**1.8**	0.006	5.00	**0.19**	0.20	652	0.004	0.031

Source:

Federal Marine Compression-Ignition Engines - Exhaust Emission Standards Reference Guide, http://epa.gov/OMS/standards/nonroad/marineci.htm

Amendments to the Regulations to Reduce Emissions From Diesel Engines on Commercial Harbor Craft Operated Within California Waters and 24 Nautical Miles of the California Baseline. ARB 2011. Table 9, Compliance Dates for Engines on Crew and Supply Vessels Nationwide.

http://www.arb.ca.gov/regact/2010/chc10/frochc931185.pdf

EPA Tier 1 emissions standards do not specify restrictions to PM, SOx, CO, or VOC. NOx is restricted to Marpol Annex VI (17 g/kW-hr).

EPA Tier 2 and Tier 3 emission standards are reported as NOx+THC. 5% is HC per Carl Moyer Program guidelines. 95% is NOx.

SOx emission factor is based on 15 ppm fuel sulfur content.

PM2.5 is 89% of PM10, per SCAQMD 2006 Final Methodology to Calculate PM2.5 and PM 2.5 Significance Thresholds, Table 5.

CO2 and N20 emission factors are from IVL: Methodology for Calculating Emissions from Ships: Update on Emission Factors, 2004, also summarized in POLA 2009 Emissions Inventory, Appendix B. CH4 is 2% of HC, per IVL study.

Bold numbers represent actual emission standards.

Table B1.17 SOx Emission Factor, Marine Engines

Harbor Craft	0.00552 g/hp-hr	
Dredging Equipment	use OFFROAD BSCF and convert to g SOx /hp-hr	
SOx (gms/hp-hr) = (S content in X/1,000,000) x (MW SO2/ MW S) x BSF =		
Where:		
X = S content in parts per million (ppm)		15 ppm
S MW = Molecular Weight		32
SO2 MW = Molecular Weight		64
BSFC for harbor craft = Brake Specific Fuel Consumption (per CARB 2007 Harbor Craft Methodology)		184 (g/hp-hr)

Table B1.18 Habor Craft Load Factor

Type		Main Engine	Auxiliary Engine
Assist tugboat		0.31	0.43
Commercial fishing		0.27	0.43
Crew boat		0.38	0.32
Excursion		0.42	0.43
Ferry		0.42	0.43
Government		0.51	0.43
Ocean tug		0.68	0.43
Tugboat		0.31	0.43
Dive boat	Work boat	0.38	0.32

Source:
2011 POLA Emissions Inventory, Table 4.6

Table B1.19 Construction Equipment Utilization by Construction Element

Year	Construction Element/Equipment	Source Type	Onsite/Off site	Power (hp) or (kW)	# Active	Equipment Activity (hr/day)	Daily Energy Demand (hp-hr) or (kW-hr)	Number Engines	Load Factor	Relevant Engine Tier	Total Work Days	Total No. 1-way Trips	No. 1-way Trips per Day	Onsite Idling Hours per Round-Trip	Miles Traveled (miles) per round-trip	Total Acreage or Weight (acres),(ton),(lb)	Peak Day Acreage or Weight (acres/day),(ton/day) (lb/day)
PHASE 1: Berth 217-220 Dredging, Wharf Improvements, TICTF Expansion																	
Sheet Piling 1																	
2015	derrick barge	offroad	onsite		1	4					35						
2015	barge/scow compressor	offroad	onsite	353	1	4	762		0.54		35						
2015	barge/scow crane	offroad	onsite	376	1	4	632		0.42		35						
2015	barge/scow deck door engine	offroad	onsite	86	1	4	306		0.89		35						
2015	barge/scow dredger	offroad	onsite	527	1	4	1,075		0.51		35						
2015	barge/scow generator	offroad	onsite	464	1	4	1,392		0.75		35						
2015	barge/scow hoist swing winch	offroad	onsite	379	1	4	470		0.31		35						
2015	barge/scow hoist swing pump	offroad	onsite	517	1	4	1,468		0.71		35						
2015	supply barge	offroad	onsite		1	4					35						
2015	barge/scow compressor	offroad	onsite	353	1	0	0		0.54		35						
2015	barge/scow crane	offroad	onsite	376	1	0	0		0.42		35						
2015	barge/scow generator	offroad	onsite	464	1	0	0		0.75		35						
2015	barge/scow hoist swing winch	offroad	onsite	379	1	0	0		0.31		35						
2015	vibratory hammer	offroad	onsite	439	1	8	2,175		0.62		35						
2015	tugboat propulsion	marine	onsite	506	1	4	1,254	2	0.31	Tier 1	35						
2015	tugboat auxiliary	marine	onsite	34	1	4	58	1	0.43	Tier 2	35						
2015	dive boat propulsion	marine	onsite	370	1	8	2,249	2	0.38	Tier 1	35						
2015	dive boat auxiliary	marine	onsite	55	1	8	141	1	0.32	Tier 3	35						
2015	pile delivery trucks - onsite idling	onroad	onsite		30	8					1	60	60	0.17			
2015	pile delivery trucks - onsite transit	onroad	onsite		30	8					1	60	60	0.17	1.0		
2015	pile delivery trucks - offsite transit	onroad	offsite		30	8					1	60	60	0.17	65		
2015	worker vehicles - offsite transit	onroad	offsite		5	1					35	350	10		12.7		
Sheet Piling 2																	
2015	derrick barge	offroad	onsite		1	4					35						
2015	barge/scow compressor	offroad	onsite	353	1	4	762		0.54		35						
2015	barge/scow crane	offroad	onsite	376	1	4	632		0.42		35						
2015	barge/scow deck door engine	offroad	onsite	86	1	4	306		0.89		35						
2015	barge/scow dredger	offroad	onsite	527	1	4	1,075		0.51		35						
2015	barge/scow generator	offroad	onsite	464	1	4	1,392		0.75		35						
2015	barge/scow hoist swing winch	offroad	onsite	379	1	4	470		0.31		35						
2015	barge/scow hoist swing pump	offroad	onsite	517	1	4	1,468		0.71		35						
2015	supply barge	offroad	onsite		1	4					35						
2015	barge/scow compressor	offroad	onsite	353	1	0	0		0.54		35						
2015	barge/scow crane	offroad	onsite	376	1	0	0		0.42		35						
2015	barge/scow generator	offroad	onsite	464	1	0	0		0.75		35						
2015	barge/scow hoist swing winch	offroad	onsite	379	1	0	0		0.31		35						
2015	pile hammer	offroad	onsite	439	1	8	2,175		0.62		35						
2015	tugboat propulsion	marine	onsite	506	1	4	1,254	2	0.31	Tier 1	35						
2015	tugboat auxiliary	marine	onsite	34	1	4	58	1	0.43	Tier 2	35						
2015	dive boat propulsion	marine	onsite	370	1	8	2,249	2	0.38	Tier 1	35						
2015	dive boat auxiliary	marine	onsite	55	1	8	141	1	0.32	Tier 3	35						
2015	worker vehicles - offsite transit	onroad	offsite		5	1					35	350	10		12.7		

Table B1.19 Construction Equipment Utilization by Construction Element

Year	Construction Element/Equipment	Source Type	Onsite/Off site	Power (hp) or (kW)	# Active	Equipment Activity (hr/day)	Daily Energy Demand (hp-hr) or (kW-hr)	Number Engines	Load Factor	Relevant Engine Tier	Total Work Days	Total No. 1-way Trips	No. 1-way Trips per Day	Onsite Idling Hours per Round-Trip	Miles Traveled (miles) per round-trip	Total Acreage or Weight (acres),(ton),(lb)	Peak Day Acreage or Weight (acres/day),(ton/day) (lb/day)
Dredging - Ocean Disposal																	
2015	derrick barge	offroad	onsite		1	24					4						
2015	barge/scow compressor	offroad	onsite	353	1	24	4,575		0.54		4						
2015	barge/scow crane	offroad	onsite	376	1	24	3,790		0.42		4						
2015	barge/scow deck door engine	offroad	onsite	86	1	24	1,837		0.89		4						
2015	barge/scow dredger	offroad	onsite	527	1	24	6,450		0.51		4						
2015	barge/scow generator	offroad	onsite	464	1	24	8,352		0.75		4						
2015	barge/scow hoist swing winch	offroad	onsite	379	1	24	2,820		0.31		4						
2015	barge/scow hoist swing pump	offroad	onsite	517	1	24	8,810		0.71		4						
2015	dump scow	offroad	offsite		2	24					4						
2015	barge/scow compressor	offroad	offsite	353	2	0	0		0.54		4						
2015	barge/scow crane	offroad	offsite	376	2	0	0		0.42		4						
2015	barge/scow deck door engine	offroad	offsite	86	2	0	0		0.89		4						
2015	barge/scow dredger	offroad	offsite	527	2	0	0		0.51		4						
2015	barge/scow generator	offroad	offsite	464	2	0	0		0.75		4						
2015	barge/scow hoist swing winch	offroad	offsite	379	2	0	0		0.31		4						
2015	barge/scow hoist swing pump	offroad	offsite	517	2	0	0		0.71		4						
2015	tugboat propulsion	marine	onsite	506	1	24	7,523	2	0.31	Tier 1	4						
2015	tugboat auxiliary	marine	onsite	34	1	24	346	1	0.43	Tier 2	4						
2015	tugboat propulsion	marine	offsite	506	2	24	15,046	2	0.31	Tier 1	4						
2015	tugboat auxiliary	marine	offsite	34	2	24	693	1	0.43	Tier 2	4						
2015	worker vehicles - offsite transit	onroad	offsite		7.5	1					4	60	15		12.7		
Dredging - Upland Disposal																	
2015	derrick barge	offroad	onsite		1	24					12						
2015	barge/scow compressor	offroad	onsite	353	1	24	4,575		0.54		12						
2015	barge/scow crane	offroad	onsite	376	1	24	3,790		0.42		12						
2015	barge/scow deck door engine	offroad	onsite	86	1	24	1,837		0.89		12						
2015	barge/scow dredger	offroad	onsite	527	1	24	6,450		0.51		12						
2015	barge/scow generator	offroad	onsite	464	1	24	8,352		0.75		12						
2015	barge/scow hoist swing winch	offroad	onsite	379	1	24	2,820		0.31		12						
2015	barge/scow hoist swing pump	offroad	onsite	517	1	24	8,810		0.71		12						
2015	dump scow	offroad	onsite		1	24					12						
2015	barge/scow compressor	offroad	onsite	353	1	0	0		0.54		12						
2015	barge/scow crane	offroad	onsite	376	1	0	0		0.42		12						
2015	barge/scow deck door engine	offroad	onsite	86	1	1	77		0.89		12						
2015	barge/scow dredger	offroad	onsite	527	1	0	0		0.51		12						
2015	barge/scow generator	offroad	onsite	464	1	0	0		0.75		12						
2015	barge/scow hoist swing winch	offroad	onsite	379	1	0	0		0.31		12						
2015	barge/scow hoist swing pump	offroad	onsite	517	1	0	0		0.71		12						
2015	tugboat propulsion	marine	onsite	506	1	24	7,523	2	0.31	Tier 1	12						
2015	tugboat auxiliary	marine	onsite	34	1	24	346	1	0.43	Tier 2	12						
2015	tugboat propulsion	marine	onsite	506	1	24	7,523	2	0.31	Tier 1	12						
2015	tugboat auxiliary	marine	onsite	34	1	24	346	1	0.43	Tier 2	12						
2015	excavator	offroad	onsite	211	1	24	2,880		0.57		12						
2015	sweeping truck	offroad	onsite	511	1	24	6,990		0.57		12						
2015	haul trucks - onsite idling	onroad	onsite		400	8					12	800	200	0.17			
2015	haul trucks - onsite transit	onroad	onsite		400	8					12	800	200	0.17	1.0		
2015	haul trucks - offsite transit	onroad	offsite		400	8					12	800	200	0.17	200		
2015	worker vehicles - offsite transit	onroad	offsite		7.5	1					12	180	15		12.7		

Table B1.19 Construction Equipment Utilization by Construction Element

Year	Construction Element/Equipment	Source Type	Onsite/Off site	Power (hp) or (kW)	# Active	Equipment Activity (hr/day)	Daily Energy Demand (hp-hr) or (kW-hr)	Number Engines	Load Factor	Relevant Engine Tier	Total Work Days	Total No. 1-way Trips	No. 1-way Trips per Day	Onsite Idling Hours per Round-Trip	Miles Traveled (miles) per round-trip	Total Acreage or Weight (acres),(ton),(lb)	Peak Day Acreage or Weight (acres/day),(ton/day) (lb/day)	
Crane Rail Extension																		
2015	excavator	offroad	onsite	211	1	8	960		0.57		10							
2015	crane	offroad	onsite	279	2	4	960		0.43		25							
2015	pile hammer	offroad	onsite	439	1	8	2,175		0.62		25							
2015	loader	offroad	onsite	101	1	8	443		0.55		10							
2015	forklift	offroad	onsite	200	1	8	480		0.30		50							
2015	skip loader	offroad	onsite	101	1	8	443		0.55		10							
2015	paving machine	offroad	onsite	110	1	8	466		0.53		1							
2015	water truck	offroad	onsite	511	1	8	2,330		0.57		50							
2015	concrete delivery trucks - onsite idling	onroad	onsite		90	8					4	180	45	0.17				
2015	concrete delivery trucks - onsite transit	onroad	onsite		90	8					4	180	45	0.17	1.0			
2015	concrete delivery trucks - offsite transit	onroad	offsite		90	8					4	180	45	0.17	65			
2015	haul trucks - onsite idling	onroad	onsite		90	8					10	180	18	0.17				
2015	haul trucks - onsite transit	onroad	onsite		90	8					10	180	18	0.17	1.0			
2015	haul trucks - offsite transit	onroad	offsite		90	8					10	180	18	0.17	20.0			
2015	rail delivery trucks - onsite idling	onroad	onsite		20	8					2	40	20	0.17				
2015	rail delivery trucks - onsite transit	onroad	onsite		20	8					2	40	20	0.17	1.0			
2015	rail delivery trucks - offsite transit	onroad	offsite		20	8					2	40	20	0.17	65			
2015	pile delivery trucks - onsite idling	onroad	onsite		175	8					35	350	10	0.17				
2015	pile delivery trucks - onsite transit	onroad	onsite		175	8					35	350	10	0.17	1.0			
2015	pile delivery trucks - offsite transit	onroad	offsite		175	8					35	350	10	0.17	65			
2015	debris haul trucks - onsite idling	onroad	onsite		20	8					1	40	40	0.17				
2015	debris haul delivery trucks - onsite transit	onroad	onsite		20	8					1	40	40	0.17	1.0			
2015	debris haul delivery trucks - offsite transit	onroad	offsite		20	8					1	40	40	0.17	20.0			
2015	haul trucks - onsite idling	onroad	onsite		115	8					8	230	29	0.17				
2015	haul delivery trucks - onsite transit	onroad	onsite		115	8					8	230	29	0.17	1.0			
2015	haul delivery trucks - offsite transit	onroad	offsite		115	8					8	230	29	0.17	20.0			
2015	concrete slurry delivery trucks - onsite idl	onroad	onsite		15	8					4	30	8	0.17				
2015	concrete slurry delivery trucks - onsite tra	onroad	onsite		15	8					4	30	8	0.17	1.0			
2015	concrete slurry delivery trucks - offsite tra	onroad	offsite		15	8					4	30	8	0.17	20.0			
2015	asphalt delivery trucks - onsite idling	onroad	onsite		15	8					1	30	30	0.17				
2015	asphalt delivery trucks - onsite transit	onroad	onsite		15	8					1	30	30	0.17	1.0			
2015	asphalt delivery trucks - offsite transit	onroad	offsite		15	8					1	30	30	0.17	20.0			
2015	worker vehicles - offsite transit	onroad	offsite		11.25	1					50	1125	22.5		12.7			
2015	truck loading	fugitive	onsite		90	8							10			2,275	228	ton/yr, ton/day
2015	truck loading	fugitive	onsite		115	8							8			2,908	363	ton/yr, ton/day
2015	asphalt offgassing	fugitive	onsite			8					1		1			6	6	acre

Table B1.19 Construction Equipment Utilization by Construction Element

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TICTF Expansion																		
2015	excavator	offroad	onsite	211	1	8	960		0.57		60							
2015	crane	offroad	onsite	279	1	8	960		0.43		60							
2015	tamper	offroad	onsite	526	1	8	1,892		0.45		60							
2015	regulator	offroad	onsite	225	1	8	1,116		0.62		60							
2015	speed swing	offroad	onsite	439	1	8	2,175		0.62		60							
2015	forklift	offroad	onsite	200	1	8	480		0.30		60							
2015	loader	offroad	onsite	101	1	8	443		0.55		60							
2015	dozer	offroad	onsite	480	1	8	2,266		0.59		60							
2015	blade/grader	offroad	onsite	217	1	8	1,060		0.61		60							
2015	swivel dump	offroad	onsite	439	1	8	2,175		0.62		60							
2015	water truck	offroad	onsite	511	1	8	2,330		0.57		60							
2015	prentice loader	offroad	onsite	350	1	8	1,540		0.55		60							
2015	tie truck	offroad	onsite	511	1	8	2,330		0.57		60							
2015	paving machine	offroad	onsite	110	1	8	466		0.53		3							
2015	roller	offroad	onsite	113	2	8	1,009		0.56		60							
2015	skip loader	offroad	onsite	101	1	8	443		0.55		60							
2015	flatbed trailer - onsite idling	onroad	onsite		38	8					2	76	38	0.17				
2015	flatbed trailer - onsite transit	onroad	onsite		38	8					2	76	38	0.17	1.0			
2015	flatbed trailer - offsite transit	onroad	offsite		38	8					2	76	38	0.17	20.0			
2015	ballast delivery trucks - onsite idling	onroad	onsite		235	8					2	470	235	0.17				
2015	ballast delivery trucks - onsite transit	onroad	onsite		235	8					2	470	235	0.17	1.0			
2015	ballast delivery trucks - offsite transit	onroad	offsite		235	8					2	470	235	0.17	20.0			
2015	haul trucks - onsite idling	onroad	onsite		180	8					10	360	36	0.17				
2015	haul trucks - onsite transit	onroad	onsite		180	8					10	360	36	0.17	1.0			
2015	haul trucks - offsite transit	onroad	offsite		180	8					10	360	36	0.17	20.0			
2015	light pole delivery trucks - onsite idling	onroad	onsite		20	8					1	40	40	0.17				
2015	light pole delivery trucks - onsite transit	onroad	onsite		20	8					1	40	40	0.17	1.0			
2015	light pole delivery trucks - offsite transit	onroad	offsite		20	8					1	40	40	0.17	65			
2015	asphalt delivery trucks - onsite idling	onroad	onsite		550	8					3	1100	367	0.17				
2015	asphalt delivery trucks - onsite transit	onroad	onsite		550	8					3	1100	367	0.17	1.0			
2015	asphalt delivery trucks - offsite transit	onroad	offsite		550	8					3	1100	367	0.17	20.0			
2015	worker vehicles - offsite transit	onroad	offsite		21.25	1					60	2550	42.5		12.7			
2015	asphalt offgassing	fugitive	onsite			8					3					6	2	acre
2015	truck loading	fugitive	onsite		235	8					10					5,942	594	ton, ton/day
2015	grading	fugitive	onsite		3	8					60					5	1.5	acre, acre/8-hr day

Table B1.19 Construction Equipment Utilization by Construction Element

Year	Construction Element/Equipment	Source Type	Onsite/Off site	Power (hp) or (kW)	# Active	Equipment Activity (hr/day)	Daily Energy Demand (hp-hr) or (kW-hr)	Number Engines	Load Factor	Relevant Engine Tier	Total Work Days	Total No. 1-way Trips	No. 1-way Trips per Day	Onsite Idling Hours per Round-Trip	Miles Traveled (miles) per round-trip	Total Acreage or Weight (acres),(ton),(lb)	Peak Day Acreage or Weight (acres/day),(ton/day) (lb/day)
PHASE 1: Crane Removal, Relocation, Delivery																	
2 LAHD Crane Relocation (B217-220)																	
2015	supply barge	offroad	onsite														
2015	barge/scow compressor	offroad	onsite	353	1	8	2,824				10						
2015	barge/scow crane	offroad	onsite	376	1	8	1,263		0.42		10						
2015	barge/scow generator	offroad	onsite	464	1	8	2,784		0.75		10						
2015	barge/scow hoist swing winch	offroad	onsite	379	1	8	940		0.31		10						
2015	welder	offroad	onsite	62	1	4	111		0.45		10						
2015	tractor	offroad	onsite	511	1	4	1,165		0.57		10						
2015	tugboat propulsion	marine	onsite	506	1	8	2,508	2	0.31	Tier 1	10						
2015	tugboat auxiliary	marine	onsite	34	1	8	115	1	0.43	Tier 2	10						
2015	worker vehicles - offsite transit	onroad	offsite		5	1					10	100	10		12.7		
2 YTI Crane Relocation/Realignment (B217-220)																	
2015	crane	offroad	onsite	279	2	8	1,919		0.43		10						
2015	welder	offroad	onsite	62	2	8	444		0.45		10						
2015	tractor	offroad	onsite	511	1	8	2,330		0.57		10						
2015	worker vehicles - offsite transit	onroad	offsite		6.25	1					10	125	12.5		12.7		
4 New YTI Crane Delivery (B217-220)																	
2015	Crane delivery ship transit		offsite		1	7											
2015	Crane delivery ship hotelling		onsite		1	17											
2015	tugboat propulsion		offsite	506	2	4	2,508	2	0.31	Tier 1	7						
2015	tugboat auxiliary		onsite	34	2	4	115	1	0.43	Tier 2	7						
2015	crane	offroad	onsite	279	2	4	960		0.43		7						
2015	welder	offroad	onsite	62	2	4	222		0.45		7						
2015	tractor	offroad	onsite	511	2	4	2,330		0.57		7						
2015	worker vehicles - offsite transit	onroad	offsite		7.5	1					7	105	15		12.7		

Table B1.19 Construction Equipment Utilization by Construction Element

Year	Construction Element/Equipment	Source Type	Onsite/Off site	Power (hp) or (kW)	# Active	Equipment Activity (hr/day)	Daily Energy Demand (hp-hr) or (kW-hr)	Number Engines	Load Factor	Relevant Engine Tier	Total Work Days	Total No. 1-way Trips	No. 1-way Trips per Day	Onsite Idling Hours per Round-Trip	Miles Traveled (miles) per round-trip	Total Acreage or Weight (acres),(ton),(lb)	Peak Day Acreage or Weight (acres/day),(ton/day) (lb/day)
PHASE 2: Berth 214-216 Dredging, Wharf & Backland Improvements																	
Sheet and King Pile Installation 1																	
2016	derrick barge	offroad	onsite		1	4					50						
2016	barge/scow compressor	offroad	onsite	353	1	4	762		0.54		50						
2016	barge/scow crane	offroad	onsite	376	1	4	632		0.42		50						
2016	barge/scow deck door engine	offroad	onsite	86	1	4	306		0.89		50						
2016	barge/scow dredger	offroad	onsite	527	1	4	1,075		0.51		50						
2016	barge/scow generator	offroad	onsite	464	1	4	1,392		0.75		50						
2016	barge/scow hoist swing winch	offroad	onsite	379	1	4	470		0.31		50						
2016	barge/scow hoist swing pump	offroad	onsite	517	1	4	1,468		0.71		50						
2016	supply barge	offroad	onsite		1	4					50						
2016	barge/scow compressor	offroad	onsite	353	1	0	0		0.54		50						
2016	barge/scow crane	offroad	onsite	376	1	0	0		0.42		50						
2016	barge/scow generator	offroad	onsite	464	1	0	0		0.75		50						
2016	barge/scow hoist swing winch	offroad	onsite	379	1	0	0		0.31		50						
2016	vibratory hammer	offroad	onsite	439	1	8	2,175		0.62		50						
2016	jet pump	offroad	onsite	113	1	8	667		0.74		50						
2016	tugboat propulsion	marine	onsite	506	1	4	1,254	2	0.31	Tier 1	50						
2016	tugboat auxiliary	marine	onsite	34	1	4	58	1	0.43	Tier 2	50						
2016	dive boat propulsion	marine	onsite	370	1	8	2,249	2	0.38	Tier 1	50						
2016	dive boat auxiliary	marine	onsite	55	1	8	141	1	0.32	Tier 3	50						
2016	pile delivery trucks - onsite idling	onroad	onsite		30	8					1	60	60	0.17			
2016	pile delivery trucks - onsite transit	onroad	onsite		30	8					1	60	60	0.17	1.0		
2016	pile delivery trucks - offsite transit	onroad	offsite		30	8					1	60	60	0.17	65		
2016	pile delivery trucks - onsite idling	onroad	onsite		70	8					3	140	47	0.17			
2016	pile delivery trucks - onsite transit	onroad	onsite		70	8					3	140	47	0.17	1.0		
2016	pile delivery trucks - offsite transit	onroad	offsite		70	8					3	140	47	0.17	65		
2016	worker vehicles - offsite transit	onroad	offsite		5	1					50	500	10		12.7		
Sheet and King Pile Installation 2																	
2016	derrick barge	offroad	onsite		1	4					50						
2016	barge/scow compressor	offroad	onsite	353	1	4	762		0.54		50						
2016	barge/scow crane	offroad	onsite	376	1	4	632		0.42		50						
2016	barge/scow deck door engine	offroad	onsite	86	1	4	306		0.89		50						
2016	barge/scow dredger	offroad	onsite	527	1	4	1,075		0.51		50						
2016	barge/scow generator	offroad	onsite	464	1	4	1,392		0.75		50						
2016	barge/scow hoist swing winch	offroad	onsite	379	1	4	470		0.31		50						
2016	barge/scow hoist swing pump	offroad	onsite	517	1	4	1,468		0.71		50						
2016	supply barge	offroad	onsite		1	4					50						
2016	barge/scow compressor	offroad	onsite	353	1	0	0		0.54		50						
2016	barge/scow crane	offroad	onsite	376	1	0	0		0.42		50						
2016	barge/scow generator	offroad	onsite	464	1	0	0		0.75		50						
2016	barge/scow hoist swing winch	offroad	onsite	379	1	0	0		0.31		50						
2016	pile hammer	offroad	onsite	439	1	8	2,175		0.62		50						
2016	jet pump	offroad	onsite	113	1	8	667		0.74		50						
2016	tugboat propulsion	marine	onsite	506	1	4	1,254	2	0.31	Tier 1	50						
2016	tugboat auxiliary	marine	onsite	34	1	4	58	1	0.43	Tier 2	50						
2016	dive boat propulsion	marine	onsite	370	1	8	2,249	2	0.38	Tier 1	50						
2016	dive boat auxiliary	marine	onsite	55	1	8	141	1	0.32	Tier 3	50						
2016	worker vehicles - offsite transit	onroad	offsite		5	1					50	500	10		12.7		

Table B1.19 Construction Equipment Utilization by Construction Element

Year	Construction Element/Equipment	Source Type	Onsite/Off site	Power (hp) or (kW)	# Active	Equipment Activity (hr/day)	Daily Energy Demand (hp-hr) or (kW-hr)	Number Engines	Load Factor	Relevant Engine Tier	Total Work Days	Total No. 1-way Trips	No. 1-way Trips per Day	Onsite Idling Hours per Round-Trip	Miles Traveled (miles) per round-trip	Total Acreage or Weight (acres),(ton),(lb)	Peak Day Acreage or Weight (acres/day),(ton/day) (lb/day)
Dredging - Ocean Disposal																	
2016	derrick barge	offroad	onsite		1	24					6						
2016	barge/scow compressor	offroad	onsite	353	1	24	4,575		0.54		6						
2016	barge/scow crane	offroad	onsite	376	1	24	3,790		0.42		6						
2016	barge/scow deck door engine	offroad	onsite	86	1	24	1,837		0.89		6						
2016	barge/scow dredger	offroad	onsite	527	1	24	6,450		0.51		6						
2016	barge/scow generator	offroad	onsite	464	1	24	8,352		0.75		6						
2016	barge/scow hoist swing winch	offroad	onsite	379	1	24	2,820		0.31		6						
2016	barge/scow hoist swing pump	offroad	onsite	517	1	24	8,810		0.71		6						
2016	dump scow	offroad	offsite		2	24					6						
2016	barge/scow compressor	offroad	offsite	353	2	0	0		0.54		6						
2016	barge/scow crane	offroad	offsite	376	2	0	0		0.42		6						
2016	barge/scow deck door engine	offroad	offsite	86	2	0	0		0.89		6						
2016	barge/scow dredger	offroad	offsite	527	2	0	0		0.51		6						
2016	barge/scow generator	offroad	offsite	464	2	0	0		0.75		6						
2016	barge/scow hoist swing winch	offroad	offsite	379	2	0	0		0.31		6						
2016	barge/scow hoist swing pump	offroad	offsite	517	2	0	0		0.71		6						
2016	tugboat propulsion	marine	onsite	506	1	24	7,523	2	0.31	Tier 1	6						
2016	tugboat auxiliary	marine	onsite	34	1	24	346	1	0.43	Tier 2	6						
2016	tugboat propulsion	marine	offsite	506	2	24	15,046	2	0.31	Tier 1	6						
2016	tugboat auxiliary	marine	offsite	34	2	24	693	1	0.43	Tier 2	6						
2016	worker vehicles - offsite transit	onroad	offsite		7.5	1					6	90	15		12.7		
Dredging - Upland Disposal																	
2016	derrick barge	offroad	onsite		1	24					17						
2016	barge/scow compressor		onsite	353	1	24	4,575		0.54		17						
2016	barge/scow crane		onsite	376	1	24	3,790		0.42		17						
2016	barge/scow deck door engine		onsite	86	1	24	1,837		0.89		17						
2016	barge/scow dredger		onsite	527	1	24	6,450		0.51		17						
2016	barge/scow generator		onsite	464	1	24	8,352		0.75		17						
2016	barge/scow hoist swing winch		onsite	379	1	24	2,820		0.31		17						
2016	barge/scow hoist swing pump		onsite	517	1	24	8,810		0.71		17						
2016	dump scow	offroad	onsite		1	24					17						
2016	barge/scow compressor		onsite	353	1	0	0		0.54		17						
2016	barge/scow crane		onsite	376	1	0	0		0.42		17						
2016	barge/scow deck door engine		onsite	86	1	1	77		0.89		17						
2016	barge/scow dredger		onsite	527	1	0	0		0.51		17						
2016	barge/scow generator		onsite	464	1	0	0		0.75		17						
2016	barge/scow hoist swing winch		onsite	379	1	0	0		0.31		17						
2016	barge/scow hoist swing pump		onsite	517	1	0	0		0.71		17						
2016	tugboat propulsion	marine	onsite	506	1	24	7,523	2	0.31	Tier 1	17						
2016	tugboat auxiliary	marine	onsite	34	1	24	346	1	0.43	Tier 2	17						
2016	tugboat propulsion	marine	onsite	506	1	24	7,523	2	0.31	Tier 1	17						
2016	tugboat auxiliary	marine	onsite	34	1	24	346	1	0.43	Tier 2	17						
2016	excavator	offroad	onsite	211	1	8	960		0.57		17						
2016	sweeping truck	offroad	onsite	511	1	8	2,330		0.57		17						
2016	haul trucks - onsite idling	onroad	onsite		1,700	8					17	3400	200	0.17			
2016	haul trucks - onsite transit	onroad	onsite		1,700	8					17	3400	200	0.17	1.0		
2016	haul trucks - offsite transit	onroad	offsite		1,700	8					17	3400	200	0.17	200		
2016	worker vehicles - offsite transit	onroad	offsite		7.5	1					17	255	15		12.7		

Table B1.19 Construction Equipment Utilization by Construction Element

Year	Construction Element/Equipment	Source Type	Onsite/Off site	Power (hp) or (kW)	# Active	Equipment Activity (hr/day)	Daily Energy Demand (hp-hr) or (kW-hr)	Number Engines	Load Factor	Relevant Engine Tier	Total Work Days	Total No. 1-way Trips	No. 1-way Trips per Day	Onsite Idling Hours per Round-Trip	Miles Traveled (miles) per round-trip	Total Acreage or Weight (acres),(ton),(lb)	Peak Day Acreage or Weight (acres/day),(ton/day) (lb/day)	
Concrete Runway																		
2015	excavator	offroad	onsite	211	1	8	960		0.57		10							
2015	skip loader	offroad	onsite	101	1	8	443		0.55		10							
2015	paving machine	offroad	onsite	110	1	8	466		0.53		1							
2015	water truck	offroad	onsite	511	1	8	2,330		0.57		10							
2015	haul trucks - onsite idling	onroad	onsite		200	8					5	400	80	0.17				
2015	haul trucks - onsite transit	onroad	onsite		200	8					5	400	80	0.17	1.0			
2015	haul trucks - offsite transit	onroad	offsite		200	8					5	400	80	0.17	20.0			
2015	concrete delivery trucks - onsite idling	onroad	onsite		100	8					2	200	100	0.17				
2015	concrete delivery trucks - onsite transit	onroad	onsite		100	8					2	200	100	0.17	1.0			
2015	concrete delivery trucks - offsite transit	onroad	offsite		100	8					2	200	100	0.17	65			
2015	base material delivery trucks - onsite idlin	onroad	onsite		100	8					1	200	200	0.17				
2015	base material delivery trucks - onsite trans	onroad	onsite		100	8					1	200	200	0.17	1.0			
2015	base material delivery trucks - offsite tran	onroad	offsite		100	8					1	200	200	0.17	65			
2015	worker vehicles - offsite transit	onroad	offsite		5	1					10	100	10		12.7			
2015	truck loading	fugitive	onsite		200	8					5					5,057	1,011	ton/yr, ton/day
2015	grading/scraping	fugitive	onsite		2	8					10					0.7	1.0	acre, acre/8-hr day
2015	asphalt offgassing	fugitive	onsite			8					1					0.7	0.7	acre
Cold plane and ac overlay																		
2015	scraper			477	1	8	2,750		0.72		8							
2015	paving machine	offroad	onsite	110	1	8	466		0.53		2							
2015	roller	offroad	onsite	113	2	8	1,009		0.56		8							
2015	skip loader	offroad	onsite	101	1	8	443		0.55		8							
2015	asphalt delivery trucks - onsite idling	onroad	onsite		1,150	8					2	2300	1,150	0.17				
2015	asphalt delivery trucks - onsite transit	onroad	onsite		1,150	8					2	2300	1,150	0.17	1.0			
2015	asphalt delivery trucks - offsite transit	onroad	offsite		1,150	8					2	2300	1,150	0.17	20.0			
2015	scraped material hauling trucks - onsite id	onroad	onsite		1,150	8					2	2300	1,150	0.17				
2015	scraped material hauling trucks - onsite tr	onroad	onsite		1,150	8					2	2300	1,150	0.17	1.0			
2015	scraped material hauling trucks - offsite tr	onroad	offsite		1,150	8					2	2300	1,150	0.17	20.0			
2015	worker vehicles - offsite transit	onroad	offsite		6.25	1					8	100	12.5		12.7			
2015	haul truck loading	fugitive	onsite		1,150	8					2					29,076	14,538	ton/yr, ton/day
2015	grading/scraping	fugitive	onsite		2	8					8					24	1.0	acre, acre/8-hr day
2015	asphalt offgassing	fugitive	onsite			8					2					24	12	acre, acre/day
Slurry seal																		
2015	slurry truck	offroad	onsite	511	1	8	2,330		0.57		30							
2015	pickup trucks - onsite idling	onroad	onsite		2	8					30	4	4	0.17				
2015	pickup trucks - onsite transit	onroad	onsite		2	8					30	4	4	0.17	1.0			
2015	pickup trucks - offsite transit	onroad	offsite		2	8					30	4	4	0.17	20.0			
2015	worker vehicles - offsite transit	onroad	offsite		1.25	1					30	75	2.5		12.7			
2015	asphalt offgassing	fugitive	onsite			8					30					133	5	acre, acre/day

Table B1.19 Construction Equipment Utilization by Construction Element

Year	Construction Element/Equipment	Source Type	Onsite/Off site	Power (hp) or (kW)	# Active	Equipment Activity (hr/day)	Daily Energy Demand (hp-hr) or (kW-hr)	Number Engines	Load Factor	Relevant Engine Tier	Total Work Days	Total No. 1-way Trips	No. 1-way Trips per Day	Onsite Idling Hours per Round-Trip	Miles Traveled (miles) per round-trip	Total Acreage or Weight (acres),(ton),(lb)	Peak Day Acreage or Weight (acres/day),(ton/day) (lb/day)
Striping																	
2015	striping truck	offroad	onsite	5	1	8	27		0.62		20						
2015	worker vehicles - offsite transit	onroad	offsite		1.25	1					20	50	2.5		12.7		
6 Crane Height Raising and Boom Extension (4 cranes at B212-213, 2 cranes at B217-220)																	
2015	crane	offroad	onsite	279	2	8	1,919		0.43		12						
2015	aerial lift	offroad	onsite	46	8	8	1,342		0.46		72						
2015	welder	offroad	onsite	62	2	4	222		0.45		72						
2015	worker vehicles - offsite transit	onroad	offsite		15	1					72		30		12.7		
2015	crane	offroad	onsite	2935	1	7	8,834		0.43		12						

Notes and assumptions:

Onsite truck idling is 5 minutes per trip x 2 one-way trips = 10 minutes per truck. 0.17

Construction vehicle and worker one-way vehicle transit miles were obtained from CalEEMod, Appendix A, Chapter 4.5 and associated Appendix D, Table 4.2 for Los Angeles - South Coast as well as from APL EIR/EIS and Google Maps.

VMT for haul trucks:	20	miles
VMT for haul trucks used for upland disposal of dredged materials (Kettleman Class I landfill assumed):	200	miles
VMT for pile, concrete and rail delivery (obtained from APL EIR/EIS for pile delivery):	65	miles
VMT for workers, Home-Work VMT:	12.7	miles
VMT for onsite travel assumed:	1	miles/round-trip
Construction worker trips were obtained from CalEEMod, Appendix A, Chapter 4.5.	1.25	workers/equipment

Provided by LAHD Engineering.

Information provided by Starcrest
Information provided by YTI
Information provided by POLA
Calculated

Table B1.20 **Operational Activity Matrix**

		CEQA Baseline	NEPA Baseline						Proposed Project					
		(January 2012-December 2012)	**2012**	**2015**	**2016**	**2017**	**2020**	**2026**	**2012**	**2015**	**2016**	**2017**	**2020**	**2026**
Annual TEUs 577,120 moves	**TEU Factor: 1.726**	996,109	996,109	1,230,126	1,267,816	1,306,611	1,430,376	1,692,000	996,109	1,230,126	1,267,816	1,380,253	1,596,153	1,913,000
Annual Ship Calls:														
Size Category	**Assumed Capacity**													
1,000	1,000-1,999	10	10	0	0	0	0	0	10					
2,000	2,000-2,999	37	37	52	52	52	52	52	37	52	52	52	52	52
3,000	3,000-3,999	0	0	52	52	52	52	52	0	52	52	52	52	52
4,000	4,000-4,999	1	1	0	0	0	0	0	1					
5,000	5,000-5,999	9	9	0	0	0	0	0	9					
6,000	6,000-6,999	87	87	94	94	52	0	0	87	94	94	77		
7,000	7,000-7,999	5	5	8	8	0	0	0	5	8	8			
8,000	8,000-9,999	0	0	0	0	50	102	102	0				52	
10,000	10,000-10,999	0	0	0	0	0	0	0	0					52
11,000	11,000-11,999	0	0	0	0	0	0	0	0					
12,000	12,000-12,999	0	0	0	0	0	0	0	0			25	50	50
13,000	13,000-13,999	0	0	0	0	0	0	0	0					
Reefer		13	13	0	0	0	0	0	13	0	0	0	0	0
Total Annual Ship Calls		162	162	206	206	206	206	206	162	206	206	206	206	206
Peak Day Ship Calls - Ships at Berth		3	3	4	4	4	4	4	3	4	4	4	4	4
Peak Day Number of Transits		3	3	4	4	4	4	4	3	4	4	4	4	4
Op hours - Ships		16hr/day, 7 day/wk	16/7	16/7	16/7	16/7	16/7	16/7	16/7	16/7	16/7	16/7	16/7	16/7

Information provided by Starcrest
Information provided by YTI
Information provided by POLA
Calculated

Table B1.20 **Operational Activity Matrix**

		Alt 1 No Project						Alt 2 No Federal Action					
		2012	**2015**	**2016**	**2017**	**2020**	**2026**	**2012**	**2015**	**2016**	**2017**	**2020**	**2026**
Annual TEUs 577,120 moves	**TEU Factor: 1.726**	996,109	1,230,126	1,267,816	1,306,611	1,430,376	1,692,000	996,109	1,230,126	1,267,816	1,306,611	1,430,376	1,692,000
Annual Ship Calls:													
Size Category	**Assumed Capacity**												
1,000	1,000-1,999	10						10					
2,000	2,000-2,999	37	52	52	52	52	52	37	52	52	52	52	52
3,000	3,000-3,999	0	52	52	52	52	52	0	52	52	52	52	52
4,000	4,000-4,999	1						1					
5,000	5,000-5,999	9						9					
6,000	6,000-6,999	87	94	94	52			87	94	94	52		
7,000	7,000-7,999	5	8	8				5	8	8			
8,000	8,000-9,999	0			50	102	102	0			50	102	102
10,000	10,000-10,999	0						0					
11,000	11,000-11,999	0						0					
12,000	12,000-12,999	0						0					
13,000	13,000-13,999	0						0					
Reefer		13	0	0	0	0	0	13	0	0	0	0	0
Total Annual Ship Calls		162	206	206	206	206	206	162	206	206	206	206	206
Peak Day Ship Calls - Ships at Berth		3	4	4	4	4	4	3	4	4	4	4	4
Peak Day Number of Transits		3	4	4	4	4	4	3	4	4	4	4	4
Op hours - Ships		16/7	16/7	16/7	16/7	16/7	16/7	16/7	16/7	16/7	16/7	16/7	16/7

Information provided by Starcrest
Information provided by YTI
Information provided by POLA
Calculated

Table B1.20 **Operational Activity Matrix**

		Alt 3 Improve Only B217-220					
		2012	**2015**	**2016**	**2017**	**2020**	**2026**
Annual TEUs 577,120 moves	**TEU Factor: 1.726**	996,109	1,230,126	1,267,816	1,380,253	1,596,153	1,913,000
Annual Ship Calls:							
Size Category	**Assumed Capacity**						
1,000	1,000-1,999	10					
2,000	2,000-2,999	37	52	52	52	52	52
3,000	3,000-3,999	0	52	52	52	52	52
4,000	4,000-4,999	1					
5,000	5,000-5,999	9					
6,000	6,000-6,999	87	94	94	52	26	26
7,000	7,000-7,999	5	8	8			
8,000	8,000-9,999	0				52	
10,000	10,000-10,999	0			50	50	102
11,000	11,000-11,999	0					
12,000	12,000-12,999	0					
13,000	13,000-13,999	0					
Reefer		13	0	0	0	0	0
Total Annual Ship Calls		162	206	206	206	232	232
Peak Day Ship Calls - Ships at Berth		3	4	4	4	5	5
Peak Day Number of Transits		3	4	4	4	5	5
Op hours - Ships		16/7	16/7	16/7	16/7	16/7	16/7

Table B1.20 **Operational Activity Matrix**

		CEQA Baseline	NEPA Baseline						Proposed Project					
		(January 2012-December 2012)	2012	2015	2016	2017	2020	2026	2012	2015	2016	2017	2020	2026
Hotelling Time per Ship Call		varies by vessel size; 49 hours/call on average	varies by vessel size; 49 hours/call on average	50.4	50.4	50.4	50.4	50.4	varies by vessel size; 49 hours/call on average	50.4	50.4	50.4	50.4	50.4
Operating Berths		B212-213 B214-216	B212-213 B214-216	B212-213 B214-216	B212-213 B214-216	B212-213 B214-216	B212-213 B214-216	B212-213 B214-216	B212-213 B214-216	B212-213 B214-216	B212-213 B217-220	B212-213 B214-216 B217-220	B212-213 B214-216 B217-220	B212-213 B214-216 B217-220
AMPd Berths		B214-216	B214-216	B212-213 B214-216	B212-213 B214-216	B212-213 B214-216	B212-213 B214-216	B212-213 B214-216	B214-216	B212-213 B214-216	B212-213 B217-220	B212-213 B214-216 B217-220	B212-213 B214-216 B217-220	B212-213 B214-216 B217-220
Peak Day Ship Calls/Transits:			0	0	0	0	0	0						
Size Category	Assumed Capacity		0	0	0	0	0	0						
1,000	1,000-1,999		0	0	0	0	0	0	0					
2,000	2,000-2,999	1	1	1	1	1	1	1	1	1	1	1	1	1
3,000	3,000-3,999		0	1	1	1	1	1	0	1	1	1	1	1
4,000	4,000-4,999		0	0	0	0	0	0	0					
5,000	5,000-5,999		0	0	0	0	0	0	0					
6,000	6,000-6,999	2	2	1	1	1	0	0	2	1	1	1		
7,000	7,000-7,999		0	1	1	0	0	0	0	1	1			
8,000	8,000-9,999		0	0	0	1	2	2	0				1	
10,000	10,000-10,999		0	0	0	0	0	0	0					1
11,000	11,000-11,999		0	0	0	0	0	0	0					
12,000	12,000-12,999		0	0	0	0	0	0	0			1	1	1
13,000	13,000-13,999		0	0	0	0	0	0	0					
Reefer			0	0	0	0	0	0	0					
Peak Day Hotelling Times (hr):			0	0	0	0	0	0						
Size Category	Assumed Capacity		0	0	0	0	0	0						
1,000	1,000-1,999		0	0	0	0	0	0	0					
2,000	2,000-2,999	6	6	10.5	10.5	10.5	10.5	10.5	6	10.5	10.5	10.5	10.5	10.5
3,000	3,000-3,999		0	10.5	10.5	10.5	10.5	10.5	0	10.5	10.5	10.5	10.5	10.5
4,000	4,000-4,999		0	0.0	0.0	0.0	0.0	0.0	0	0	0			
5,000	5,000-5,999		0	0.0	0.0	0.0	0.0	0.0	0	0	0			
6,000	6,000-6,999	19/18	19/18	10.5	10.5	10.5	0.0	0.0	19/18	10.5	10.5	19		
7,000	7,000-7,999		0	10.5	10.5	0.0	0.0	0.0	0	10.5	10.5			
8,000	8,000-9,999		0	0.0	0.0	10.5	10.5	10.5	0				19	
10,000	10,000-10,999		0	0.0	0.0	0.0	0.0	0.0	0					19
11,000	11,000-11,999		0	0.0	0.0	0.0	0.0	0.0	0					
12,000	12,000-12,999		0	0.0	0.0	0.0	0.0	0.0	0			19	19	19
13,000	13,000-13,999		0	0.0	0.0	0.0	0.0	0.0	0					
Reefer			0	0.0	0.0	0.0	0.0	0.0	0					

Table B1.20 **Operational Activity Matrix**

		Alt 1 No Project						Alt 2 No Federal Action					
		2012	2015	2016	2017	2020	2026	2012	2015	2016	2017	2020	2026
Hotelling Time per Ship Call		varies by vessel size; 49 hours/call on average	50.4	50.4	50.4	50.4	50.4	varies by vessel size; 49 hours/call on average	50.4	50.4	50.4	50.4	50.4
Operating Berths		B212-213 B214-216	B212-213 B214-216	B212-213 B214-216	B212-213 B214-216	B212-213 B214-216	B212-213 B214-216	B212-213 B214-216	B212-213 B214-216	B212-213 B214-216	B212-213 B214-216	B212-213 B214-216	B212-213 B214-216
AMPd Berths		B214-216	B212-213 B214-216	B212-213 B214-216	B212-213 B214-216	B212-213 B214-216	B212-213 B214-216	B214-216	B212-213 B214-216	B212-213 B214-216	B212-213 B214-216	B212-213 B214-216	B212-213 B214-216
Peak Day Ship Calls/Transits:													
Size Category	Assumed Capacity												
1,000	1,000-1,999	0						0					
2,000	2,000-2,999	1	1	1	1	1	1	1	1	1	1	1	1
3,000	3,000-3,999	0	1	1	1	1	1	0	1	1	1	1	1
4,000	4,000-4,999	0						0					
5,000	5,000-5,999	0						0					
6,000	6,000-6,999	2	1	1	1			2	1	1	1		
7,000	7,000-7,999	0	1	1				0	1	1			
8,000	8,000-9,999	0			1	2	2	0			1	2	2
10,000	10,000-10,999	0						0					
11,000	11,000-11,999	0						0					
12,000	12,000-12,999	0						0					
13,000	13,000-13,999	0						0					
Reefer		0						0					
Peak Day Hotelling Times (hr):													
Size Category	Assumed Capacity												
1,000	1,000-1,999	0						0					
2,000	2,000-2,999	6	10.5	10.5	10.5	10.5	10.5	6	10.5	10.5	10.5	10.5	10.5
3,000	3,000-3,999	0	10.5	10.5	10.5	10.5	10.5	0	10.5	10.5	10.5	10.5	10.5
4,000	4,000-4,999	0	47	0				0	0	0			
5,000	5,000-5,999	0	48	0				0	0	0			
6,000	6,000-6,999	19/18	10.5	10.5	10.5			19/18	10.5	10.5	10.5		
7,000	7,000-7,999	0	10.5	10.5				0	10.5	10.5			
8,000	8,000-9,999	0			10.5	10.5	10.5	0			10.5	10.5	10.5
10,000	10,000-10,999	0						0					
11,000	11,000-11,999	0						0					
12,000	12,000-12,999	0						0					
13,000	13,000-13,999	0						0					
Reefer		0						0					

Table B1.20 **Operational Activity Matrix**

		Alt 3 Improve Only B217-220					
		2012	**2015**	**2016**	**2017**	**2020**	**2026**
Hotelling Time per Ship Call		varies by vessel size; 49 hours/call on average	50.4	50.4	50.4	50.4	50.4
Operating Berths		B212-213 B214-216	B212-213 B214-216	B212-213 B214-216	B212-213 B214-216 B217-220	B212-213 B214-216 B217-220	B212-213 B214-216 B217-220
AMPd Berths		B212-213 B214-216	B212-213 B214-216	B212-213 B217-220	B212-213 B214-216 B217-220	B212-213 B214-216 B217-220	B212-213 B214-216 B217-220
Peak Day Ship Calls/Transits:							
Size Category	Assumed Capacity						
1,000	1,000-1,999	0					
2,000	2,000-2,999	1	1	1	1	1	1
3,000	3,000-3,999	0	1	1	1	1	1
4,000	4,000-4,999	0					
5,000	5,000-5,999	0					
6,000	6,000-6,999	2	1	1	1	1	1
7,000	7,000-7,999	0	1	1			
8,000	8,000-9,999	0				1	
10,000	10,000-10,999	0			1	1	2
11,000	11,000-11,999	0					
12,000	12,000-12,999	0					
13,000	13,000-13,999	0					
Reefer		0					
Peak Day Hotelling Times (hr):							
Size Category	Assumed Capacity						
1,000	1,000-1,999	0					
2,000	2,000-2,999	6	10.5	10.5	10.5	10.5	10.5
3,000	3,000-3,999	0	10.5	10.5	10.5	10.5	10.5
4,000	4,000-4,999	0	0	0			
5,000	5,000-5,999	0	0	0			
6,000	6,000-6,999	19/18	10.5	10.5	19	19	19
7,000	7,000-7,999	0	10.5	10.5			
8,000	8,000-9,999	0				10.5	
10,000	10,000-10,999	0			19	10.5	10.5
11,000	11,000-11,999	0					
12,000	12,000-12,999	0					
13,000	13,000-13,999	0					
Reefer		0					

Table B1.20 **Operational Activity Matrix**

		CEQA Baseline	NEPA Baseline						Proposed Project					
		(January 2012-December 2012)	**2012**	**2015**	**2016**	**2017**	**2020**	**2026**	**2012**	**2015**	**2016**	**2017**	**2020**	**2026**
Trucks		On-road vehicle emissions were calculated using link-based volumes and speeds provided by Cambridge Systematics Inc.												
Peak Day Factor for Trucks (annual truck trips/peak day truck trips)		294	294	282	278	274	274	274	294	282	278	274	274	274
Avg. truck Idling time at in-gate (min/truck)		6 mins.	Constant for all years and alternatives											
Avg. truck idling time at out-gate (min/truck)		8 mins.	Constant for all years and alternatives											
Avg. truck idling time while on-terminal, not including at gate (min/truck)		10 mins.	Constant for all years and alternatives											
Avg. truck on-terminal drive time, excluding idling time (min/truck)		9 mins.	Constant for all years and alternatives											
Avg. truck driving distance while on-terminal (mi/truck)		1.5mi	Constant for all years and alternatives											
Op hours - Truck gate		3 days/week x 8 hrs												
		3 days/week x 16hrs	3x8hrs 3x16hrs	2x9hrs 4x18hrs					3x8hrs 3x16hrs	2x9hrs 4x18hrs	2x9hrs 4x18hrs	2x9hrs 4x18hrs	2x9hrs 4x18hrs	2x9hrs 4x18hrs
Truck gate daily start time for single-shift day		8am	8am	7am					8am	7am	7am	7am	7am	7am
Truck gate daily end time for single-shift day		5pm	Constant for all years and alternatives											
Truck gate daily start time for double-shift day (start night shift)		6pm	Constant for all years and alternatives											
Truck gate daily end time for double-shift day (end night shift)		3am	Constant for all years and alternatives											
Rail														
Peak Day On-Dock Rail Factor (peak day rail TEUs/avg. day rail TEUs)		1.08	Constant for all years & alternatives (used to determine peak day activity for switcher locomotives)											
Average Line Haul Locomotive Size (hp)		4,000	Constant for all years and alternatives											
Average Daily PHL Switch Engine Use On-Dock (locomotive-hr/day)		5.7	Per Doug Hansen/YTI: This is all activity attributed to crews assigned to YTI at TICTF. Consider this figure to be a factor and scale it accordingly.											
On-Dock Line Haul Locomotive load factor		0.28	Constant for all years and alternatives											
Line Haul Locomotive Operating Hours on Port per trip (hr/loco) (westbound exports)		1.0	Constant for all years and alternatives											
Line Haul Locomotive Operating Hours on Port per trip (hr/loco) eastbound imports)		2.5	Constant for all years and alternatives											
Op hours - On-Dock Rail Yard		16hr/day, 7 day/	Constant for all years and alternatives											
On-Dock Rail Yard Daily Start Time		8am	Constant for all years and alternatives											
On-Dock Rail Yard Daily End Time		3am	Constant for all years and alternatives											
Terminal Acreage (total)		181.4	181.4	181.4	181.4	181.4	181.4	181.4	181.4	181.4	181.4	181.4	181.4	181.4
Space Assignment 6A		4.0												
Building Space, sq ft (total)		62,227	Constant for all years and alternatives											
No. of Wharf Cranes		10	10						10	10	10	14	14	14
Yard Equipment														
Type	**Average HP/Load Factor**	**Annual Hrs by Type**												
Electric Wharf Crane	N/A	12,391	12,391	15,302	15,771	16,253	17,793	21,047	12,391	15,302	15,771	17,170	19,855	23,797
Forklift (Diesel)	191/.30	5,637	5,637	6,961	7,175	7,394	8,095	9,575	5,637	6,961	7,175	7,811	9,033	10,826
RMG cranes	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rub-trd Gantry Crane	451/.20	21,704	21,704	26,803	27,624	28,469	31,166	36,867	21,704	26,803	27,624	30,074	34,778	41,682
Top handler (terminal)	318/.59	50,629	50,629	62,523	64,439	66,411	72,701	85,999	50,629	62,523	64,439	70,154	81,127	97,232
Top handler (TICTF)	318/.59	6,777	6,777	8,369	8,626	8,889	9,732	11,511	6,777	8,369	8,626	9,391	10,859	13,015
Side pick	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Yard tractor (terminal)	201/.39	171,929	171,929	212,320	218,826	225,522	246,884	292,040	171,929	212,320	218,826	238,232	275,497	330,185
Yard tractor (TICTF)	201/.39	21,758	21,758	26,870	27,693	28,540	31,244	36,958	21,758	26,870	27,693	30,149	34,865	41,786

Table B1.20 **Operational Activity Matrix**

		Alt 1 No Project						Alt 2 No Federal Action					
		2012	**2015**	**2016**	**2017**	**2020**	**2026**	**2012**	**2015**	**2016**	**2017**	**2020**	**2026**
Trucks													
Peak Day Factor for Trucks (annual truck trips/peak day truck trips)		294	282	278	274	274	274	294	282	278	274	274	274
Avg. truck Idling time at in-gate (min/truck)													
Avg. truck idling time at out-gate (min/truck)													
Avg. truck idling time while on-terminal, not including at gate (min/truck)													
Avg. truck on-terminal drive time, excluding idling time (min/truck)													
Avg. truck driving distance while on-terminal (mi/truck)													
Op hours - Truck gate		3x8hrs	2x9hrs	2x9hrs	2x9hrs	2x9hrs	2x9hrs	3x8hrs	2x9hrs	2x9hrs	2x9hrs	2x9hrs	2x9hrs
		3x16hrs	4x18hrs	4x18hrs	4x18hrs	4x18hrs	4x18hrs	3x16hrs	4x18hrs	4x18hrs	4x18hrs	4x18hrs	4x18hrs
Truck gate daily start time for single-shift day		8am	7am	7am	7am	7am	7am	8am	7am	7am	7am	7am	7am
Truck gate daily end time for single-shift day													
Truck gate daily start time for double-shift day (start night shift)													
Truck gate daily end time for double-shift day (end night shift)													
Rail													
Peak Day On-Dock Rail Factor (peak day rail TEUs/avg. day rail TEUs)													
Average Line Haul Locomotive Size (hp)													
Average Daily PHL Switch Engine Use On-Dock (locomotive-hr/day)													
On-Dock Line Haul Locomotive load factor													
Line Haul Locomotive Operating Hours on Port per trip (hr/loco) (westbound exports)													
Line Haul Locomotive Operating Hours on Port per trip (hr/loco) eastbound imports)													
Op hours - On-Dock Rail Yard	16												
On-Dock Rail Yard Daily Start Time													
On-Dock Rail Yard Daily End Time													
Terminal Acreage (total)		181.4	181.4	181.4	181.4	181.4	181.4	181.4	181.4	181.4	181.4	181.4	181.4
Space Assignment 6A													
Building Space, sq ft (total)													
No. of Wharf Cranes		10	10	10	10	10	10	10	10	10	10	10	10
Yard Equipment													
Type	**Average HP/Load Factor**												
Electric Wharf Crane	N/A	12,391	15,302	15,771	16,253	17,793	21,047	12,391	15,302	15,771	16,253	17,793	21,047
Forklift (Diesel)	191/.30	5,637	6,961	7,175	7,394	8,095	9,575	5,637	6,961	7,175	7,394	8,095	9,575
RMG cranes	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rub-trd Gantry Crane	451/.20	21,704	26,803	27,624	28,469	31,166	36,867	21,704	26,803	27,624	28,469	31,166	36,867
Top handler (terminal)	318/.59	50,629	62,523	64,439	66,411	72,701	85,999	50,629	62,523	64,439	66,411	72,701	85,999
Top handler (TICTF)	318/.59	6,777	8,369	8,626	8,889	9,732	11,511	6,777	8,369	8,626	8,889	9,732	11,511
Side pick	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Yard tractor (terminal)	201/.39	171,929	212,320	218,826	225,522	246,884	292,040	171,929	212,320	218,826	225,522	246,884	292,040
Yard tractor (TICTF)	201/.39	21,758	26,870	27,693	28,540	31,244	36,958	21,758	26,870	27,693	28,540	31,244	36,958

Table B1.20 **Operational Activity Matrix**

		Alt 3 Improve Only B217-220					
		2012	**2015**	**2016**	**2017**	**2020**	**2026**
Trucks							
Peak Day Factor for Trucks (annual truck trips/peak day truck trips)		294	282	278	274	274	274
Avg. truck Idling time at in-gate (min/truck)							
Avg. truck idling time at out-gate (min/truck)							
Avg. truck idling time while on-terminal, not including at gate (min/truck)							
Avg. truck on-terminal drive time, excluding idling time (min/truck)							
Avg. truck driving distance while on-terminal (mi/truck)							
Op hours - Truck gate		3x8hrs 3x16hrs	2x9hrs 4x18hrs	2x9hrs 4x18hrs	2x9hrs 4x18hrs	2x9hrs 4x18hrs	2x9hrs 4x18hrs
Truck gate daily start time for single-shift day		8am	7am	7am	7am	7am	7am
Truck gate daily end time for single-shift day							
Truck gate daily start time for double-shift day (start night shift)							
Truck gate daily end time for double-shift day (end night shift)							
Rail							
Peak Day On-Dock Rail Factor (peak day rail TEUs/avg. day rail TEUs)							
Average Line Haul Locomotive Size (hp)							
Average Daily PHL Switch Engine Use On-Dock (locomotive-hr/day)							
On-Dock Line Haul Locomotive load factor							
Line Haul Locomotive Operating Hours on Port per trip (hr/loco) (westbound exports)							
Line Haul Locomotive Operating Hours on Port per trip (hr/loco) eastbound imports)							
Op hours - On-Dock Rail Yard	16						
On-Dock Rail Yard Daily Start Time							
On-Dock Rail Yard Daily End Time							
Terminal Acreage (total)		181.4	181.4	181.4	181.4	181.4	181.4
Space Assignment 6A							
Building Space, sq ft (total)							
No. of Wharf Cranes		10	10	10	14	14	14
Yard Equipment							
Type	**Average HP/Load Factor**						
Electric Wharf Crane	N/A	12,391	15,302	15,771	17,170	19,855	23,797
Forklift (Diesel)	191/.30	5,637	6,961	7,175	7,811	9,033	10,826
RMG cranes	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rub-trd Gantry Crane	451/.20	21,704	26,803	27,624	30,074	34,778	41,682
Top handler (terminal)	318/.59	50,629	62,523	64,439	70,154	81,127	97,232
Top handler (TICTF)	318/.59	6,777	8,369	8,626	9,391	10,859	13,015
Side pick	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Yard tractor (terminal)	201/.39	171,929	212,320	218,826	238,232	275,497	330,185
Yard tractor (TICTF)	201/.39	21,758	26,870	27,693	30,149	34,865	41,786

Table B1.20 **Operational Activity Matrix**

		CEQA Baseline	NEPA Baseline						Proposed Project					
		(January 2012-December 2012)	2012	2015	2016	2017	2020	2026	2012	2015	2016	2017	2020	2026
Type	**Average HP/Load Factor**	**Day Hours by Type**												
Electric Wharf Crane	N/A	128	128	158	163	168	184	217	128	158	163	177	205	246
Forklift (Diesel)	191/.30	80	80	99	102	105	115	136	80	99	102	111	128	154
RMG cranes	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rub-trd Gantry Crane	451/.20	96	96	119	122	126	138	163	96	119	122	133	154	184
Top handler (terminal)	318/.59	288	288	356	367	378	414	489	288	356	367	399	461	553
Top handler (TICTF)	318/.59	32	32	40	41	42	46	54	32	40	41	44	51	61
Side pick	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Yard tractor (terminal)	201/.39	1,280	1,280	1,581	1,629	1,679	1,838	2,174	1,280	1,581	1,629	1,774	2,051	2,458
Yard tractor (TICTF)	201/.39	128	128	158	163	168	184	217	128	158	163	177	205	246
Type	**Average HP/Load Factor**	**he Consumption, gal**												
Forklift (Propane)	57.6HP/ .3 load factor	1,726	1,726	2,131	2,197	2,264	2,478	2,932	1,726	2,131	2,197	2,392	2,766	3,315
Forklift (Propane)	57.6HP/ .3 load factor	6	6	7	7	7	8	9	6	7	7	8	9	11
Non-Container Vehicle Trips														
Shift Splits Employees (Avg all types)		314/210/9	314/210/9						314/210/9	332/222/9	334/224/10	353/239/10	400/291/10	468/367/10
Peak Daily Employees		533	533						533	563	568	602	701	845
Average Weekday non-container truck vehicle trips		25	25	31	32	33	36	42	25	31	32	35	40	48
Annual non-container truck vehicle		312	312	385	397	409	448	530	312	385	397	432	500	599

Table B1.20 **Operational Activity Matrix**

		Alt 1 No Project						Alt 2 No Federal Action					
		2012	**2015**	**2016**	**2017**	**2020**	**2026**	**2012**	**2015**	**2016**	**2017**	**2020**	**2026**
Type	**Average HP/Load Factor**												
Electric Wharf Crane	N/A	128	158	163	168	184	217	128	158	163	168	184	217
Forklift (Diesel)	191/.30	80	99	102	105	115	136	80	99	102	105	115	136
RMG cranes	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rub-trd Gantry Crane	451/.20	96	119	122	126	138	163	96	119	122	126	138	163
Top handler (terminal)	318/.59	288	356	367	378	414	489	288	356	367	378	414	489
Top handler (TICTF)	318/.59	32	40	41	42	46	54	32	40	41	42	46	54
Side pick	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Yard tractor (terminal)	201/.39	1,280	1,581	1,629	1,679	1,838	2,174	1,280	1,581	1,629	1,679	1,838	2,174
Yard tractor (TICTF)	201/.39	128	158	163	168	184	217	128	158	163	168	184	217
Type	**Average HP/Load Factor**												
Forklift (Propane)	57.6HP/ .3 load factor	1,726	2,131	2,197	2,264	2,478	2,932	1,726	2,131	2,197	2,264	2,478	2,932
Forklift (Propane)	57.6HP/ .3 load factor	6	7	7	7	8	9	6	7	7	7	8	9
Non-Container Vehicle Trips													
Shift Splits Employees (Avg all types)		314/210/9	332/222/9	334/224/10	344/229/10	367/253/10	424/317/10	314/210/9	332/222/9	334/224/10	344/229/10	367/253/10	424/317/10
Peak Daily Employees		533	563	568	583	630	751	533	563	568	583	630	751
Average Weekday non-container truck vehicle trips		25	31	32	33	36	42	25	31	32	33	36	42
Annual non-container truck vehicle		312	385	397	409	448	530	312	385	397	409	448	530

Table B1.20 **Operational Activity Matrix**

		Alt 3 Improve Only B217-220					
		2012	**2015**	**2016**	**2017**	**2020**	**2026**
Type	**Average HP/Load Factor**						
Electric Wharf Crane	N/A	128	158	163	177	205	246
Forklift (Diesel)	191/.30	80	99	102	111	128	154
RMG cranes	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rub-trd Gantry Crane	451/.20	96	119	122	133	154	184
Top handler (terminal)	318/.59	288	356	367	399	461	553
Top handler (TICTF)	318/.59	32	40	41	44	51	61
Side pick	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Yard tractor (terminal)	201/.39	1,280	1,581	1,629	1,774	2,051	2,458
Yard tractor (TICTF)	201/.39	128	158	163	177	205	246
Type	**Average HP/Load Factor**						
Forklift (Propane)	57.6HP/ .3 load factor	1,726	2,131	2,197	2,392	2,766	3,315
Forklift (Propane)	57.6HP/ .3 load factor	6	7	7	8	9	11
Non-Container Vehicle Trips							
Shift Splits Employees (Avg all types)		314/210/9	332/222/9	334/224/10	353/239/10	400/291/10	468/367/10
Peak Daily Employees		533	563	568	602	701	845
Average Weekday non-container truck vehicle trips		25	31	32	35	40	48
Annual non-container truck vehicle		312	385	397	432	500	599

Table B1.21 Container Ship Activity Summary

	Analysis Year	TEUs	TEU Factor	Moves or No. Containers	No. Annual Vessel Calls	Peak Day Vessels at Berth	Peak Day Vessel Transits	Peak Day AMP Unmitigated	Peak Day AMP Mitigated	Peak Day VSRP Zone 4 Unmitigated	Peak Day VSR Zone 4 Mitigated
Baseline											
	2012	996,109	1.726	577,120	162	3	3	0	0	2	2
Proposed Project											
	2015	1,230,126	1.750	702,929	206	4	4	0	0	2	2
	2016	1,267,816	1.750	724,466	206	4	4	0	0	2	2
	2017	1,380,253	1.750	788,716	206	4	4	1	1	2	3
	2020	1,596,153	1.750	912,087	206	4	4	2	2	2	3
	2026	1,913,000	1.750	1,093,143	206	4	4	2	3	2	3
Alternative 1 No Project											
	2015	1,230,126	1.750	702,929	206	4	4	0	0	2	2
	2016	1,267,816	1.750	724,466	206	4	4	0	0	2	2
	2017	1,306,611	1.750	746,635	206	4	4	1	1	2	2
	2020	1,430,376	1.750	817,358	206	4	4	2	2	2	2
	2026	1,692,000	1.750	966,857	206	4	4	2	2	2	2
Alternative 2 No Federal Action											
	2015	1,230,126	1.750	702,929	206	4	4	0	0	2	2
	2016	1,267,816	1.750	724,466	206	4	4	0	0	2	2
	2017	1,306,611	1.750	746,635	206	4	4	1	1	2	3
	2020	1,430,376	1.750	817,358	206	4	4	2	2	2	3
	2026	1,692,000	1.750	966,857	206	4	4	2	3	2	3
Alternative 3 Reduced Project											
	2015	1,230,126	1.750	702,929	206	4	4	0	0	2	2
	2016	1,267,816	1.750	724,466	206	4	4	0	0	2	2
	2017	1,380,253	1.750	788,716	206	4	4	2	2	2	3
	2020	1,596,153	1.750	912,087	232	5	5	3	3	2	4
	2026	1,913,000	1.750	1,093,143	232	5	5	3	4	2	4

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Table B1.22 **Operational OGV Emissions - Baseline (2012) and Future Baseline (2015, 2016, 2017, 2020, 2026)**

			Vessel Characteristics			Activity								
	Vessel Type	Engine/Source Type	Engine Rating (kW)	Vessel Year	Max Rated Speed (knots)	Peak Day Berth Calls	Peak Day Transits	Peak Day Hotelling Time Per Vessel (hr/day)	Annual Berth Calls	Annual Transits	Peak Day Fuel Sulfur	Peak Day Number of Transits in Compliance with VSRP in Zone 3	Peak Day Number of Transits in Compliance with VSRP in Zone 4	Peak Day Number of Vessels using AMP
Baseline	2 operating berths (B212-213, B213-215); 1 berth with AMP (B212-213)													
2012	Container1000	Propulsion	12,516	1995	19				10	20	0.5%			
	Container1000	Auxiliary							10	20	0.5%	0	0	0
	Container1000	Auxiliary Boiler							10	20	0.5%	0	0	0
	Container2000	Propulsion	21,053	2004	22	1	1	6.0	37	74	0.5%	1	1	0
	Container2000	Auxiliary				1	1	6.0	37	74	0.5%	1	1	0
	Container2000	Auxiliary Boiler				1	1	6.0	37	74	0.5%	1	1	0
	Container4000	Propulsion	51,389	2009	25				1	2	0.5%			
	Container4000	Auxiliary							1	2	0.5%	0	0	0
	Container4000	Auxiliary Boiler							1	2	0.5%	0	0	0
	Container5000	Propulsion	58,823	2000	25				9	18	0.5%			
	Container5000	Auxiliary							9	18	0.5%	0	0	0
	Container5000	Auxiliary Boiler							9	18	0.5%	0	0	0
	Container6000	Propulsion	63,817	2003	25	2	2	18.5	87	174	0.5%	2	1	0
	Container6000	Auxiliary				2	2	18.5	87	174	0.5%	2	1	0
	Container6000	Auxiliary Boiler				2	2	18.5	87	174	0.5%	2	1	0
	Container7000	Propulsion	68,639	2001	25				5	10	0.5%	0		0
	Container7000	Auxiliary							5	10	0.5%	0	0	0
	Container7000	Auxiliary Boiler							5	10	0.5%	0	0	0
	Reefer	Propulsion	9,736	1992	20				13	26	0.5%			
	Reefer	Auxiliary							13	26	0.5%	0	0	0
	Reefer	Auxiliary Boiler							13	26	0.5%	0	0	0
	Reefer	Refrigerant Loss							13	26				
Total 2012						**3**	**3**		**162**	**324**		**3**	**2**	**0**

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Information provided by YTI
Information provided by POLA

Table B1.22

	Vessel Type	Engine/Source Type	Peak Day Number of Transits with Slide Valves	Annual Fuel Sulfur	Annual Number of Transits in Compliance with VSRP in Zone 3	Annual Number of Transits in Compliance with VSRP in Zone 4	Annual Number of Vessels using AMP	Annual Number of Transits with Slide Valves	Average Auxiliary Load (kW) Transit	Maneuvering	Berth/ Anchorage
Baseline	2 operating berths (B212-213, B213-215); 1										
2012	Container1000	Propulsion		0.5%	20	15	0	0			
	Container1000	Auxiliary		0.5%	20	15	0	0	619	955	367
	Container1000	Auxiliary Boiler		0.5%	20	15	0	0	178	241	241
	Container2000	Propulsion	0	0.5%	74	57	0	25			
	Container2000	Auxiliary	0	0.5%	74	57	0	25	981	2,180	1,030
	Container2000	Auxiliary Boiler	0	0.5%	74	57	0	25	322	325	325
	Container4000	Propulsion		0.5%	2	2	0	1			
	Container4000	Auxiliary		0.5%	2	2	0	1	1,434	2,526	1,161
	Container4000	Auxiliary Boiler		0.5%	2	2	0	1	369	492	492
	Container5000	Propulsion		0.5%	18	14	0	0			
	Container5000	Auxiliary		0.5%	18	14	0	0	1,176	4,200	1,025
	Container5000	Auxiliary Boiler		0.5%	18	14	0	0	630	630	630
	Container6000	Propulsion	0	0.5%	174	134	14	18			
	Container6000	Auxiliary	0	0.5%	174	134	14	18	1,386	2,560	1,047
	Container6000	Auxiliary Boiler	0	0.5%	174	134	14	18	486	565	565
	Container7000	Propulsion	0	0.5%	10	8	0	0			
	Container7000	Auxiliary	0	0.5%	10	8	0	0	1,539	3,434	1,066
	Container7000	Auxiliary Boiler	0	0.5%	10	8	0	0	530	551	551
	Reefer	Propulsion		0.5%	26	20	0	0			
	Reefer	Auxiliary		0.5%	26	20	0	0	568	1,537	863
	Reefer	Auxiliary Boiler		0.5%	26	20	0	0	122	255	255
	Reefer	Refrigerant Loss									
Total 2012					**324**	**249**	**14**	**44**			

Table B1.22 **Operational OGV Emissions - Baseline (2012) and Future Baseline (2015, 2016, 2017, 2020, 2026)**

			Vessel Characteristics			Activity								
	Vessel Type	Engine/Source Type	Engine Rating (kW)	Vessel Year	Max Rated Speed (knots)	Peak Day Berth Calls	Peak Day Transits	Peak Day Hotelling Time Per Vessel (hr/day)	Annual Berth Calls	Annual Transits	Peak Day Fuel Sulfur	Peak Day Number of Transits in Compliance with VSRP in Zone 3	Peak Day Number of Transits in Compliance with VSRP in Zone 4	Peak Day Number of Vessels using AMP
2015	Container1000	Propulsion	12,516	1995	19	0	0	0	10	20	0.1%	0	0	0
	Container1000	Auxiliary	0	0	0	0	0	0	10	20	0.1%	0	0	0
	Container1000	Auxiliary Boiler	0	0	0	0	0	0	10	20	0.1%	0	0	0
	Container2000	Propulsion	21,053	2004	22	1	1	6	37	74	0.1%	1	1	0
	Container2000	Auxiliary	0	0	0	1	1	6	37	74	0.1%	1	1	0
	Container2000	Auxiliary Boiler	0	0	0	1	1	6	37	74	0.1%	1	1	0
	Container4000	Propulsion	51,389	2009	25	0	0	0	1	2	0.1%	0	0	0
	Container4000	Auxiliary	0	0	0	0	0	0	1	2	0.1%	0	0	0
	Container4000	Auxiliary Boiler	0	0	0	0	0	0	1	2	0.1%	0	0	0
	Container5000	Propulsion	58,823	2000	25	0	0	0	9	18	0.1%	0	0	0
	Container5000	Auxiliary	0	0	0	0	0	0	9	18	0.1%	0	0	0
	Container5000	Auxiliary Boiler	0	0	0	0	0	0	9	18	0.1%	0	0	0
	Container6000	Propulsion	63,817	2003	25	2	2	19	87	174	0.1%	2	1	0
	Container6000	Auxiliary	0	0	0	2	2	19	87	174	0.1%	2	1	0
	Container6000	Auxiliary Boiler	0	0	0	2	2	19	87	174	0.1%	2	1	0
	Container7000	Propulsion	68,639	2001	25	0	0	0	5	10	0.1%	0	0	0
	Container7000	Auxiliary	0	0	0	0	0	0	5	10	0.1%	0	0	0
	Container7000	Auxiliary Boiler	0	0	0	0	0	0	5	10	0.1%	0	0	0
	Reefer	Propulsion	9,736	1992	20	0	0	0	13	26	0.1%	0	0	0
	Reefer	Auxiliary	0	0	0	0	0	0	13	26	0.1%	0	0	0
	Reefer	Auxiliary Boiler	0	0	0	0	0	0	13	26	0.1%	0	0	0
Total 2015						**3**	**3**		**162**	**324**		**3**	**2**	**0**

Table B1.22

	Vessel Type	Engine/Source Type	Peak Day Number of Transits with Slide Valves	Annual Fuel Sulfur	Annual Number of Transits in Compliance with VSRP in Zone 3	Annual Number of Transits in Compliance with VSRP in Zone 4	Annual Number of Vessels using AMP	Annual Number of Transits with Slide Valves	Average Auxiliary Load (kW) Transit	Maneuvering	Berth/ Anchorage
2015	Container1000	Propulsion	0	0.1%	20	15	5	0	0	0	0
	Container1000	Auxiliary	0	0.1%	20	15	5	0	619	955	367
	Container1000	Auxiliary Boiler	0	0.1%	20	15	5	0	178	241	241
	Container2000	Propulsion	0	0.1%	74	57	19	25	0	0	0
	Container2000	Auxiliary	0	0.1%	74	57	19	25	981	2,180	1,030
	Container2000	Auxiliary Boiler	0	0.1%	74	57	19	25	322	325	325
	Container4000	Propulsion	0	0.1%	2	2	1	1	0	0	0
	Container4000	Auxiliary	0	0.1%	2	2	1	1	1,434	2,526	1,161
	Container4000	Auxiliary Boiler	0	0.1%	2	2	1	1	369	492	492
	Container5000	Propulsion	0	0.1%	18	14	5	0	0	0	0
	Container5000	Auxiliary	0	0.1%	18	14	5	0	1,176	4,200	1,025
	Container5000	Auxiliary Boiler	0	0.1%	18	14	5	0	630	630	630
	Container6000	Propulsion	0	0.1%	174	134	44	18	0	0	0
	Container6000	Auxiliary	0	0.1%	174	134	44	18	1,386	2,560	1,047
	Container6000	Auxiliary Boiler	0	0.1%	174	134	44	18	486	565	565
	Container7000	Propulsion	0	0.1%	10	8	3	0	0	0	0
	Container7000	Auxiliary	0	0.1%	10	8	3	0	1,539	3,434	1,066
	Container7000	Auxiliary Boiler	0	0.1%	10	8	3	0	530	551	551
	Reefer	Propulsion	0	0.1%	26	20	7	0	0	0	0
	Reefer	Auxiliary	0	0.1%	26	20	7	0	568	1,537	863
	Reefer	Auxiliary Boiler	0	0.1%	26	20	7	0	122	255	255
Total 2015					**324**	**249**	**81**	**44**			

Table B1.22 **Operational OGV Emissions - Baseline (2012) and Future Baseline (2015, 2016, 2017, 2020, 2026)**

			Vessel Characteristics			Activity								
	Vessel Type	Engine/Source Type	Engine Rating (kW)	Vessel Year	Max Rated Speed (knots)	Peak Day Berth Calls	Peak Day Transits	Peak Day Hotelling Time Per Vessel (hr/day)	Annual Berth Calls	Annual Transits	Peak Day Fuel Sulfur	Peak Day Number of Transits in Compliance with VSRP in Zone 3	Peak Day Number of Transits in Compliance with VSRP in Zone 4	Peak Day Number of Vessels using AMP
2016	Container1000	Propulsion	12,516	1995	19	0	0	0	10	20	0.1%	0	0	0
	Container1000	Auxiliary	0	0	0	0	0	0	10	20	0.1%	0	0	0
	Container1000	Auxiliary Boiler	0	0	0	0	0	0	10	20	0.1%	0	0	0
	Container2000	Propulsion	21,053	2004	22	1	1	6	37	74	0.1%	1	1	0
	Container2000	Auxiliary	0	0	0	1	1	6	37	74	0.1%	1	1	0
	Container2000	Auxiliary Boiler	0	0	0	1	1	6	37	74	0.1%	1	1	0
	Container4000	Propulsion	51,389	2009	25	0	0	0	1	2	0.1%	0	0	0
	Container4000	Auxiliary	0	0	0	0	0	0	1	2	0.1%	0	0	0
	Container4000	Auxiliary Boiler	0	0	0	0	0	0	1	2	0.1%	0	0	0
	Container5000	Propulsion	58,823	2000	25	0	0	0	9	18	0.1%	0	0	0
	Container5000	Auxiliary	0	0	0	0	0	0	9	18	0.1%	0	0	0
	Container5000	Auxiliary Boiler	0	0	0	0	0	0	9	18	0.1%	0	0	0
	Container6000	Propulsion	63,817	2003	25	2	2	19	87	174	0.1%	2	1	0
	Container6000	Auxiliary	0	0	0	2	2	19	87	174	0.1%	2	1	0
	Container6000	Auxiliary Boiler	0	0	0	2	2	19	87	174	0.1%	2	1	0
	Container7000	Propulsion	68,639	2001	25	0	0	0	5	10	0.1%	0	0	0
	Container7000	Auxiliary	0	0	0	0	0	0	5	10	0.1%	0	0	0
	Container7000	Auxiliary Boiler	0	0	0	0	0	0	5	10	0.1%	0	0	0
	Reefer	Propulsion	9,736	1992	20	0	0	0	13	26	0.1%	0	0	0
	Reefer	Auxiliary	0	0	0	0	0	0	13	26	0.1%	0	0	0
	Reefer	Auxiliary Boiler	0	0	0	0	0	0	13	26	0.1%	0	0	0
Total 2016						**3**	**3**		**162**	**324**		**3**	**2**	**0**
2017	Container1000	Propulsion	12,516	1995	19	0	0	0	10	20	0.1%	0	0	0
	Container1000	Auxiliary	0	0	0	0	0	0	10	20	0.1%	0	0	0
	Container1000	Auxiliary Boiler	0	0	0	0	0	0	10	20	0.1%	0	0	0
	Container2000	Propulsion	21,053	2004	22	1	1	6	37	74	0.1%	1	1	1
	Container2000	Auxiliary	0	0	0	1	1	6	37	74	0.1%	1	1	1
	Container2000	Auxiliary Boiler	0	0	0	1	1	6	37	74	0.1%	1	1	1
	Container4000	Propulsion	51,389	2009	25	0	0	0	1	2	0.1%	0	0	0
	Container4000	Auxiliary	0	0	0	0	0	0	1	2	0.1%	0	0	0
	Container4000	Auxiliary Boiler	0	0	0	0	0	0	1	2	0.1%	0	0	0
	Container5000	Propulsion	58,823	2000	25	0	0	0	9	18	0.1%	0	0	0
	Container5000	Auxiliary	0	0	0	0	0	0	9	18	0.1%	0	0	0
	Container5000	Auxiliary Boiler	0	0	0	0	0	0	9	18	0.1%	0	0	0
	Container6000	Propulsion	63,817	2003	25	2	2	19	87	174	0.1%	2	1	0
	Container6000	Auxiliary	0	0	0	2	2	19	87	174	0.1%	2	1	0
	Container6000	Auxiliary Boiler	0	0	0	2	2	19	87	174	0.1%	2	1	0
	Container7000	Propulsion	68,639	2001	25	0	0	0	5	10	0.1%	0	0	0
	Container7000	Auxiliary	0	0	0	0	0	0	5	10	0.1%	0	0	0
	Container7000	Auxiliary Boiler	0	0	0	0	0	0	5	10	0.1%	0	0	0
	Reefer	Propulsion	9,736	1992	20	0	0	0	13	26	0.1%	0	0	0
	Reefer	Auxiliary	0	0	0	0	0	0	13	26	0.1%	0	0	0
	Reefer	Auxiliary Boiler	0	0	0	0	0	0	13	26	0.1%	0	0	0
Total 2017						**3**	**3**		**162**	**324**		**3**	**2**	**1**

Table B1.22

	Vessel Type	Engine/Source Type	Peak Day Number of Transits with Slide Valves	Annual Fuel Sulfur	Annual Number of Transits in Compliance with VSRP in Zone 3	Annual Number of Transits in Compliance with VSRP in Zone 4	Annual Number of Vessels using AMP	Annual Number of Transits with Slide Valves	Average Auxiliary Load (kW) Transit	Maneuvering	Berth/ Anchorage
2016	Container1000	Propulsion	0	0.1%	20	15	5	0	0	0	0
	Container1000	Auxiliary	0	0.1%	20	15	5	0	619	955	367
	Container1000	Auxiliary Boiler	0	0.1%	20	15	5	0	178	241	241
	Container2000	Propulsion	0	0.1%	74	57	19	25	0	0	0
	Container2000	Auxiliary	0	0.1%	74	57	19	25	981	2,180	1,030
	Container2000	Auxiliary Boiler	0	0.1%	74	57	19	25	322	325	325
	Container4000	Propulsion	0	0.1%	2	2	1	1	0	0	0
	Container4000	Auxiliary	0	0.1%	2	2	1	1	1,434	2,526	1,161
	Container4000	Auxiliary Boiler	0	0.1%	2	2	1	1	369	492	492
	Container5000	Propulsion	0	0.1%	18	14	5	0	0	0	0
	Container5000	Auxiliary	0	0.1%	18	14	5	0	1,176	4,200	1,025
	Container5000	Auxiliary Boiler	0	0.1%	18	14	5	0	630	630	630
	Container6000	Propulsion	0	0.1%	174	134	44	18	0	0	0
	Container6000	Auxiliary	0	0.1%	174	134	44	18	1,386	2,560	1,047
	Container6000	Auxiliary Boiler	0	0.1%	174	134	44	18	486	565	565
	Container7000	Propulsion	0	0.1%	10	8	3	0	0	0	0
	Container7000	Auxiliary	0	0.1%	10	8	3	0	1,539	3,434	1,066
	Container7000	Auxiliary Boiler	0	0.1%	10	8	3	0	530	551	551
	Reefer	Propulsion	0	0.1%	26	20	7	0	0	0	0
	Reefer	Auxiliary	0	0.1%	26	20	7	0	568	1,537	863
	Reefer	Auxiliary Boiler	0	0.1%	26	20	7	0	122	255	255
Total 2016					**324**	**249**	**81**	**44**			
2017	Container1000	Propulsion	0	0.1%	20	15	7	0	0	0	0
	Container1000	Auxiliary	0	0.1%	20	15	7	0	619	955	367
	Container1000	Auxiliary Boiler	0	0.1%	20	15	7	0	178	241	241
	Container2000	Propulsion	0	0.1%	74	57	26	25	0	0	0
	Container2000	Auxiliary	0	0.1%	74	57	26	25	981	2,180	1,030
	Container2000	Auxiliary Boiler	0	0.1%	74	57	26	25	322	325	325
	Container4000	Propulsion	0	0.1%	2	2	1	1	0	0	0
	Container4000	Auxiliary	0	0.1%	2	2	1	1	1,434	2,526	1,161
	Container4000	Auxiliary Boiler	0	0.1%	2	2	1	1	369	492	492
	Container5000	Propulsion	0	0.1%	18	14	6	0	0	0	0
	Container5000	Auxiliary	0	0.1%	18	14	6	0	1,176	4,200	1,025
	Container5000	Auxiliary Boiler	0	0.1%	18	14	6	0	630	630	630
	Container6000	Propulsion	0	0.1%	174	134	61	18	0	0	0
	Container6000	Auxiliary	0	0.1%	174	134	61	18	1,386	2,560	1,047
	Container6000	Auxiliary Boiler	0	0.1%	174	134	61	18	486	565	565
	Container7000	Propulsion	0	0.1%	10	8	4	0	0	0	0
	Container7000	Auxiliary	0	0.1%	10	8	4	0	1,539	3,434	1,066
	Container7000	Auxiliary Boiler	0	0.1%	10	8	4	0	530	551	551
	Reefer	Propulsion	0	0.1%	26	20	9	0	0	0	0
	Reefer	Auxiliary	0	0.1%	26	20	9	0	568	1,537	863
	Reefer	Auxiliary Boiler	0	0.1%	26	20	9	0	122	255	255
Total 2017					**324**	**249**	**113**	**44**			

Table B1.22 **Operational OGV Emissions - Baseline (2012) and Future Baseline (2015, 2016, 2017, 2020, 2026)**

			Vessel Characteristics			Activity								
	Vessel Type	Engine/Source Type	Engine Rating (kW)	Vessel Year	Max Rated Speed (knots)	Peak Day Berth Calls	Peak Day Transits	Peak Day Hotelling Time Per Vessel (hr/day)	Annual Berth Calls	Annual Transits	Peak Day Fuel Sulfur	Peak Day Number of Transits in Compliance with VSRP in Zone 3	Peak Day Number of Transits in Compliance with VSRP in Zone 4	Peak Day Number of Vessels using AMP
2020	Container1000	Propulsion	12,516	1995	19	0	0	0	10	20	0.1%	0	0	0
	Container1000	Auxiliary	0	0	0	0	0	0	10	20	0.1%	0	0	0
	Container1000	Auxiliary Boiler	0	0	0	0	0	0	10	20	0.1%	0	0	0
	Container2000	Propulsion	21,053	2004	22	1	1	6	37	74	0.1%	1	1	1
	Container2000	Auxiliary	0	0	0	1	1	6	37	74	0.1%	1	1	1
	Container2000	Auxiliary Boiler	0	0	0	1	1	6	37	74	0.1%	1	1	1
	Container4000	Propulsion	51,389	2009	25	0	0	0	1	2	0.1%	0	0	0
	Container4000	Auxiliary	0	0	0	0	0	0	1	2	0.1%	0	0	0
	Container4000	Auxiliary Boiler	0	0	0	0	0	0	1	2	0.1%	0	0	0
	Container5000	Propulsion	58,823	2000	25	0	0	0	9	18	0.1%	0	0	0
	Container5000	Auxiliary	0	0	0	0	0	0	9	18	0.1%	0	0	0
	Container5000	Auxiliary Boiler	0	0	0	0	0	0	9	18	0.1%	0	0	0
	Container6000	Propulsion	63,817	2003	25	2	2	19	87	174	0.1%	2	1	0
	Container6000	Auxiliary	0	0	0	2	2	19	87	174	0.1%	2	1	0
	Container6000	Auxiliary Boiler	0	0	0	2	2	19	87	174	0.1%	2	1	0
	Container7000	Propulsion	68,639	2001	25	0	0	0	5	10	0.1%	0	0	0
	Container7000	Auxiliary	0	0	0	0	0	0	5	10	0.1%	0	0	0
	Container7000	Auxiliary Boiler	0	0	0	0	0	0	5	10	0.1%	0	0	0
	Reefer	Propulsion	9,736	1992	20	0	0	0	13	26	0.1%	0	0	0
	Reefer	Auxiliary	0	0	0	0	0	0	13	26	0.1%	0	0	0
	Reefer	Auxiliary Boiler	0	0	0	0	0	0	13	26	0.1%	0	0	0
Total 2020						**3**	**3**		**162**	**324**		**3**	**2**	**1**
2026	Container1000	Propulsion	12,516	1995	19	0	0	0	10	20	0.1%	0	0	0
	Container1000	Auxiliary	0	0	0	0	0	0	10	20	0.1%	0	0	0
	Container1000	Auxiliary Boiler	0	0	0	0	0	0	10	20	0.1%	0	0	0
	Container2000	Propulsion	21,053	2004	22	1	1	6	37	74	0.1%	1	1	1
	Container2000	Auxiliary	0	0	0	1	1	6	37	74	0.1%	1	1	1
	Container2000	Auxiliary Boiler	0	0	0	1	1	6	37	74	0.1%	1	1	1
	Container4000	Propulsion	51,389	2009	25	0	0	0	1	2	0.1%	0	0	0
	Container4000	Auxiliary	0	0	0	0	0	0	1	2	0.1%	0	0	0
	Container4000	Auxiliary Boiler	0	0	0	0	0	0	1	2	0.1%	0	0	0
	Container5000	Propulsion	58,823	2000	25	0	0	0	9	18	0.1%	0	0	0
	Container5000	Auxiliary	0	0	0	0	0	0	9	18	0.1%	0	0	0
	Container5000	Auxiliary Boiler	0	0	0	0	0	0	9	18	0.1%	0	0	0
	Container6000	Propulsion	63,817	2003	25	2	2	19	87	174	0.1%	2	1	0
	Container6000	Auxiliary	0	0	0	2	2	19	87	174	0.1%	2	1	0
	Container6000	Auxiliary Boiler	0	0	0	2	2	19	87	174	0.1%	2	1	0
	Container7000	Propulsion	68,639	2001	25	0	0	0	5	10	0.1%	0	0	0
	Container7000	Auxiliary	0	0	0	0	0	0	5	10	0.1%	0	0	0
	Container7000	Auxiliary Boiler	0	0	0	0	0	0	5	10	0.1%	0	0	0
	Reefer	Propulsion	9,736	1992	20	0	0	0	13	26	0.1%	0	0	0
	Reefer	Auxiliary	0	0	0	0	0	0	13	26	0.1%	0	0	0
	Reefer	Auxiliary Boiler	0	0	0	0	0	0	13	26	0.1%	0	0	0
Total 2026						**3**	**3**		**162**	**324**		**3**	**2**	**1**

Table B1.22

	Vessel Type	Engine/Source Type	Peak Day Number of Transits with Slide Valves	Annual Fuel Sulfur	Annual Number of Transits in Compliance with VSRP in Zone 3	Annual Number of Transits in Compliance with VSRP in Zone 4	Annual Number of Vessels using AMP	Annual Number of Transits with Slide Valves	Average Auxiliary Load (kW) Transit	Maneuvering	Berth/ Anchorage
2020	Container1000	Propulsion	0	0.1%	20	15	8	0	0	0	0
	Container1000	Auxiliary	0	0.1%	20	15	8	0	619	955	367
	Container1000	Auxiliary Boiler	0	0.1%	20	15	8	0	178	241	241
	Container2000	Propulsion	0	0.1%	74	57	30	25	0	0	0
	Container2000	Auxiliary	0	0.1%	74	57	30	25	981	2,180	1,030
	Container2000	Auxiliary Boiler	0	0.1%	74	57	30	25	322	325	325
	Container4000	Propulsion	0	0.1%	2	2	1	1	0	0	0
	Container4000	Auxiliary	0	0.1%	2	2	1	1	1,434	2,526	1,161
	Container4000	Auxiliary Boiler	0	0.1%	2	2	1	1	369	492	492
	Container5000	Propulsion	0	0.1%	18	14	7	0	0	0	0
	Container5000	Auxiliary	0	0.1%	18	14	7	0	1,176	4,200	1,025
	Container5000	Auxiliary Boiler	0	0.1%	18	14	7	0	630	630	630
	Container6000	Propulsion	0	0.1%	174	134	70	18	0	0	0
	Container6000	Auxiliary	0	0.1%	174	134	70	18	1,386	2,560	1,047
	Container6000	Auxiliary Boiler	0	0.1%	174	134	70	18	486	565	565
	Container7000	Propulsion	0	0.1%	10	8	4	0	0	0	0
	Container7000	Auxiliary	0	0.1%	10	8	4	0	1,539	3,434	1,066
	Container7000	Auxiliary Boiler	0	0.1%	10	8	4	0	530	551	551
	Reefer	Propulsion	0	0.1%	26	20	10	0	0	0	0
	Reefer	Auxiliary	0	0.1%	26	20	10	0	568	1,537	863
	Reefer	Auxiliary Boiler	0	0.1%	26	20	10	0	122	255	255
Total 2020					**324**	**249**	**130**	**44**			
2026	Container1000	Propulsion	0	0.1%	20	15	8	0	0	0	0
	Container1000	Auxiliary	0	0.1%	20	15	8	0	619	955	367
	Container1000	Auxiliary Boiler	0	0.1%	20	15	8	0	178	241	241
	Container2000	Propulsion	0	0.1%	74	57	30	25	0	0	0
	Container2000	Auxiliary	0	0.1%	74	57	30	25	981	2,180	1,030
	Container2000	Auxiliary Boiler	0	0.1%	74	57	30	25	322	325	325
	Container4000	Propulsion	0	0.1%	2	2	1	1	0	0	0
	Container4000	Auxiliary	0	0.1%	2	2	1	1	1,434	2,526	1,161
	Container4000	Auxiliary Boiler	0	0.1%	2	2	1	1	369	492	492
	Container5000	Propulsion	0	0.1%	18	14	7	0	0	0	0
	Container5000	Auxiliary	0	0.1%	18	14	7	0	1,176	4,200	1,025
	Container5000	Auxiliary Boiler	0	0.1%	18	14	7	0	630	630	630
	Container6000	Propulsion	0	0.1%	174	134	70	18	0	0	0
	Container6000	Auxiliary	0	0.1%	174	134	70	18	1,386	2,560	1,047
	Container6000	Auxiliary Boiler	0	0.1%	174	134	70	18	486	565	565
	Container7000	Propulsion	0	0.1%	10	8	4	0	0	0	0
	Container7000	Auxiliary	0	0.1%	10	8	4	0	1,539	3,434	1,066
	Container7000	Auxiliary Boiler	0	0.1%	10	8	4	0	530	551	551
	Reefer	Propulsion	0	0.1%	26	20	10	0	0	0	0
	Reefer	Auxiliary	0	0.1%	26	20	10	0	568	1,537	863
	Reefer	Auxiliary Boiler	0	0.1%	26	20	10	0	122	255	255
Total 2026					**324**	**249**	**130**	**44**			

Information provided by Starcrest
Information provided by YTI
Information provided by POLA

Table B1.23 **Operational OGV Emissions Without Mitigation - Proposed Project and Alternatives**

			Vessel Characteristics			Activity														Average Auxiliary Load (kW)		
	Vessel Type	Engine/Source Type	Engine Rating (kW)	Vessel Year	Max Rated Speed (knots)	Peak Day Berth Calls	Peak Day Transits	Peak Day Hotelling Time Per Vessel (hr/day)	Annual Berth Calls	Annual Transits	Peak Day Fuel Sulfur	Peak Day Number of Transits in Compliance with VSRP in Zone 3	Peak Day Number of Transits in Compliance with VSRP in Zone 4	Peak Day Number of Vessels using AMP	Peak Day Number of Transits with Slide Valves	Annual Fuel Sulfur	Annual Number of Transits in Compliance with VSRP in Zone 3	Annual Number of Transits in Compliance with VSRP in Zone 4	Annual Number of Vessels using AMP	Annual Number of Transits with Slide Valves	Transit	Maneuvering	Berth/ Anchorage
Proposed Project																						
2015	Container1000	Propulsion	15,627	2004	20					0	0.1%					0.1%	0	0	0	0			
	Container1000	Auxiliary	4,421			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	396	942	297
	Container1000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	241	241	241
	Container2000	Propulsion	22,469	2004	22	1	1	10.5	52	104	0.1%	1	1			0.1%	99	80	26	33			
	Container2000	Auxiliary	4,649			1	1	10.5	52	104	0.1%	1	1	0	0	0.1%	99	80	26	33	981	2,180	1,035
	Container2000	Auxiliary Boiler				1	1	10.5	52	104	0.1%	1	1	0	0	0.1%	99	80	26	33	325	325	325
	Container3000	Propulsion	29,107	1999	23	1	1	10.5	52	104	0.1%	1	1	0	0	0.1%	99	80	26	33			
	Container3000	Auxiliary	3,919			1	1	10.5	52	104	0.1%	1	1	0	0	0.1%	99	80	26	33	602	2,063	516
	Container3000	Auxiliary Boiler				1	1	10.5	52	104	0.1%	1	1	0	0	0.1%	99	80	26	33	474	474	474
	Container4000	Propulsion	41,323	2000	24					0	0.1%			0	0	0.1%	0	0	0	0			
	Container4000	Auxiliary	7,058			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,434	2,523	1,161
	Container4000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	492	492	492
	Container5000	Propulsion	50,247	2002	25					0	0.1%					0.1%	0	0	0	0			
	Container5000	Auxiliary	8,228			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,176	4,200	1,008
	Container5000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	630	630	630
	Container6000	Propulsion	60,580	2006	25	1	1	10.5	94	188	0.1%	1				0.1%	179	145	47	60			
	Container6000	Auxiliary	10,631			1	1	10.5	94	188	0.1%	1	0	0	0	0.1%	179	145	47	60	1,425	2,178	986
	Container6000	Auxiliary Boiler				1	1	10.5	94	188	0.1%	1	0	0	0	0.1%	179	145	47	60	565	565	565
	Container7000	Propulsion	57,217	2006	25	1	1	10.5	8	16	0.1%			0	0	0.1%	15	12	4	5			
	Container7000	Auxiliary	10,771			1	1	10.5	8	16	0.1%	0	0	0	0	0.1%	15	12	4	5	1,539	3,434	1,066
	Container7000	Auxiliary Boiler				1	1	10.5	8	16	0.1%	0	0	0	0	0.1%	15	12	4	5	551	551	551
	Container8000	Propulsion	66,868	2006	25					0	0.1%					0.1%	0	0	0	0			
	Container8000	Auxiliary	10,911			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,416	3,158	980
	Container8000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	525	525	525
	Container9000	Propulsion	67,428	2007	25	0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0			
	Container9000	Auxiliary	11,520			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,502	3,350	1,040
	Container9000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	547	547	547
	Container10000	Propulsion	68,034	2007	25					0	0.1%					0.1%	0	0	0	0			
	Container10000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,751	3,675	1,270
	Container10000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	574	574	574
	Container11000	Propulsion	68,639	2008	25					0	0.1%					0.1%	0	0	0	0			
	Container11000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	2,000	4,000	1,500
	Container11000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	600	600	600
	Container12000	Propulsion	67,399	2010	25					0	0.1%					0.1%	0	0	0	0			
	Container12000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	2,500	4,500	2,000
	Container12000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	600	600	600
	Container13000	Propulsion																					
	Container13000	Auxiliary																					
	Container13000	Auxiliary Boiler																					
	Container14000	Propulsion																					
	Container14000	Auxiliary																					
	Container14000	Auxiliary Boiler																					
Total 2015						**4**	**4**		**206**	**412**		**3**	**2**	**0**	**0**		**391**	**317**	**103**	**132**			

Table B1.23 **Operational OGV Emissions Without Mitigation - Proposed Project and Alternatives**

			Vessel Characteristics			Activity															Average Auxiliary Load (kW)		
	Vessel Type	Engine/Source Type	Engine Rating (kW)	Vessel Year	Max Rated Speed (knots)	Peak Day Berth Calls	Peak Day Transits	Peak Day Hotelling Time Per Vessel (hr/day)	Annual Berth Calls	Annual Transits	Peak Day Fuel Sulfur	Peak Day Number of Transits in Compliance with VSRP in Zone 3	Peak Day Number of Transits in Compliance with VSRP in Zone 4	Peak Day Number of Vessels using AMP	Peak Day Number of Transits with Slide Valves	Annual Fuel Sulfur	Annual Number of Transits in Compliance with VSRP in Zone 3	Annual Number of Transits in Compliance with VSRP in Zone 4	Annual Number of Vessels using AMP	Annual Number of Transits with Slide Valves	Transit	Maneuvering	Berth/ Anchorage
Proposed Project																							
2016	Container1000	Propulsion	15,627	2004	20					0	0.1%					0.1%	0	0	0	0			
	Container1000	Auxiliary	4,421			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	396	942	297
	Container1000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	241	241	241
	Container2000	Propulsion	22,469	2004	22	1	1	10.5	52	104	0.1%	1	1			0.1%	99	80	26	33			
	Container2000	Auxiliary	4,649			1	1	10.5	52	104	0.1%	1	1	0	0	0.1%	99	80	26	33	981	2,180	1,035
	Container2000	Auxiliary Boiler				1	1	10.5	52	104	0.1%	1	1	0	0	0.1%	99	80	26	33	325	325	325
	Container3000	Propulsion	29,107	1999	23	1	1	10.5	52	104	0.1%	1	1	0	0	0.1%	99	80	26	33			
	Container3000	Auxiliary	3,919			1	1	10.5	52	104	0.1%	1	1	0	0	0.1%	99	80	26	33	602	2,063	516
	Container3000	Auxiliary Boiler				1	1	10.5	52	104	0.1%	1	1	0	0	0.1%	99	80	26	33	474	474	474
	Container4000	Propulsion	41,323	2000	24					0	0.1%			0	0	0.1%	0	0	0	0			
	Container4000	Auxiliary	7,058			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,434	2,523	1,161
	Container4000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	492	492	492
	Container5000	Propulsion	50,247	2002	25					0	0.1%					0.1%	0	0	0	0			
	Container5000	Auxiliary	8,228			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,176	4,200	1,008
	Container5000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	630	630	630
	Container6000	Propulsion	60,580	2006	25	1	1	10.5	94	188	0.1%	1				0.1%	179	145	47	60			
	Container6000	Auxiliary	10,631			1	1	10.5	94	188	0.1%	1	0	0	0	0.1%	179	145	47	60	1,425	2,178	986
	Container6000	Auxiliary Boiler				1	1	10.5	94	188	0.1%	1	0	0	0	0.1%	179	145	47	60	565	565	565
	Container7000	Propulsion	57,217	2006	25	1	1	10.5	8	16	0.1%			0	0	0.1%	15	12	4	5			
	Container7000	Auxiliary	10,771			1	1	10.5	8	16	0.1%	0	0	0	0	0.1%	15	12	4	5	1,539	3,434	1,066
	Container7000	Auxiliary Boiler				1	1	10.5	8	16	0.1%	0	0	0	0	0.1%	15	12	4	5	551	551	551
	Container8000	Propulsion	66,868	2006	25					0	0.1%					0.1%	0	0	0	0			
	Container8000	Auxiliary	10,911			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,416	3,158	980
	Container8000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	525	525	525
	Container9000	Propulsion	67,428	2007	25	0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0			
	Container9000	Auxiliary	11,520			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,502	3,350	1,040
	Container9000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	547	547	547
	Container10000	Propulsion	68,034	2007	25					0	0.1%					0.1%	0	0	0	0			
	Container10000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,751	3,675	1,270
	Container10000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	574	574	574
	Container11000	Propulsion	68,639	2008	25					0	0.1%					0.1%	0	0	0	0			
	Container11000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	2,000	4,000	1,500
	Container11000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	600	600	600
	Container12000	Propulsion	67,399	2010	25					0	0.1%					0.1%	0	0	0	0			
	Container12000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	2,500	4,500	2,000
	Container12000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	600	600	600
	Container13000	Propulsion																					
	Container13000	Auxiliary																					
	Container13000	Auxiliary Boiler																					
	Container14000	Propulsion																					
	Container14000	Auxiliary																					
	Container14000	Auxiliary Boiler																					
Total 2016						**4**	**4**		**206**	**412**		**3**	**2**	**0**	**0**		**391**	**317**	**103**	**132**			

Table B1.23 **Operational OGV Emissions Without Mitigation - Proposed Project and Alternatives**

			Vessel Characteristics			Activity															Average Auxiliary Load (kW)		
	Vessel Type	Engine/Source Type	Engine Rating (kW)	Vessel Year	Max Rated Speed (knots)	Peak Day Berth Calls	Peak Day Transits	Peak Day Hotelling Time Per Vessel (hr/day)	Annual Berth Calls	Annual Transits	Peak Day Fuel Sulfur	Peak Day Number of Transits in Compliance with VSRP in Zone 3	Peak Day Number of Transits in Compliance with VSRP in Zone 4	Peak Day Number of Vessels using AMP	Peak Day Number of Transits with Slide Valves	Annual Fuel Sulfur	Annual Number of Transits in Compliance with VSRP in Zone 3	Annual Number of Transits in Compliance with VSRP in Zone 4	Annual Number of Vessels using AMP	Annual Number of Transits with Slide Valves	Transit	Maneuvering	Berth/ Anchorage
Proposed Project																							
2017	Container1000	Propulsion	15,627	2004	20					0	0.1%					0.1%	0	0	0	0			
	Container1000	Auxiliary	4,421			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	396	942	297
	Container1000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	241	241	241
	Container2000	Propulsion	22,469	2004	22	1	1	10.5	52	104	0.1%	1	1	1		0.1%	99	80	36	33			
	Container2000	Auxiliary	4,649			1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	36	33	981	2,180	1,035
	Container2000	Auxiliary Boiler				1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	36	33	325	325	325
	Container3000	Propulsion	29,107	1999	23	1	1	10.5	52	104	0.1%	1	1		0	0.1%	99	80	36	33			
	Container3000	Auxiliary	3,919			1	1	10.5	52	104	0.1%	1	1	0	0	0.1%	99	80	36	33	602	2,063	516
	Container3000	Auxiliary Boiler				1	1	10.5	52	104	0.1%	1	1	0	0	0.1%	99	80	36	33	474	474	474
	Container4000	Propulsion	41,323	2000	24					0	0.1%			0	0	0.1%	0	0	0	0			
	Container4000	Auxiliary	7,058			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,434	2,523	1,161
	Container4000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	492	492	492
	Container5000	Propulsion	50,247	2002	25					0	0.1%					0.1%	0	0	0	0			
	Container5000	Auxiliary	8,228			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,176	4,200	1,008
	Container5000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	630	630	630
	Container6000	Propulsion	60,580	2006	25	1	1	19.0	77	154	0.1%	1				0.1%	146	119	54	49			
	Container6000	Auxiliary	10,631			1	1	19.0	77	154	0.1%	1	0	0	0	0.1%	146	119	54	49	1,425	2,178	986
	Container6000	Auxiliary Boiler				1	1	19.0	77	154	0.1%	1	0	0	0	0.1%	146	119	54	49	565	565	565
	Container7000	Propulsion	57,217	2006	25					0	0.1%	0	0	0	0	0.1%	0	0	0	0			
	Container7000	Auxiliary	10,771			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,539	3,434	1,066
	Container7000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	551	551	551
	Container8000	Propulsion	66,868	2006	25	0	0	0.0	0	0	0.1%					0.1%	0	0	0	0			
	Container8000	Auxiliary	10,911			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,416	3,158	980
	Container8000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	525	525	525
	Container9000	Propulsion	67,428	2007	25	0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0			
	Container9000	Auxiliary	11,520			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,502	3,350	1,040
	Container9000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	547	547	547
	Container10000	Propulsion	68,034	2007	25					0	0.1%					0.1%	0	0	0	0			
	Container10000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,751	3,675	1,270
	Container10000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	574	574	574
	Container11000	Propulsion	68,639	2008	25					0	0.1%					0.1%	0	0	0	0			
	Container11000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	2,000	4,000	1,500
	Container11000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	600	600	600
	Container12000	Propulsion	67,399	2010	25	1	1	19.0	25	50	0.1%					0.1%	48	39	18	16			
	Container12000	Auxiliary	na			1	1	19.0	25	50	0.1%	0	0	0	0	0.1%	48	39	18	16	2,500	4,500	2,000
	Container12000	Auxiliary Boiler				1	1	19.0	25	50	0.1%	0	0	0	0	0.1%	48	39	18	16	600	600	600
	Container13000	Propulsion																					
	Container13000	Auxiliary																					
	Container13000	Auxiliary Boiler																					
	Container14000	Propulsion																					
	Container14000	Auxiliary																					
	Container14000	Auxiliary Boiler																					
Total 2017						**4**	**4**		**206**	**412**		**3**	**2**	**1**	**0**		**391**	**317**	**144**	**132**			

Table B1.23 **Operational OGV Emissions Without Mitigation - Proposed Project and Alternatives**

			Vessel Characteristics			Activity														Average Auxiliary Load (kW)		
	Vessel Type	Engine/Source Type	Engine Rating (kW)	Vessel Year	Max Rated Speed (knots)	Peak Day Berth Calls	Peak Day Transits	Peak Day Hotelling Time Per Vessel (hr/day)	Annual Berth Calls	Annual Transits	Peak Day Fuel Sulfur	Peak Day Number of Transits in Compliance with VSRP in Zone 3	Peak Day Number of Transits in Compliance with VSRP in Zone 4	Peak Day Number of Vessels using AMP	Peak Day Number of Transits with Slide Valves	Annual Fuel Sulfur	Annual Number of Transits in Compliance with VSRP in Zone 3	Annual Number of Transits in Compliance with VSRP in Zone 4	Annual Number of Vessels using AMP	Annual Number of Transits with Slide Valves	Transit	Maneuvering	Berth/ Anchorage
Proposed Project																						
2020	Container1000	Propulsion	15,627	2004	20					0	0.1%					0.1%	0	0	0	0		
	Container1000	Auxiliary	4,421			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	396	942	297
	Container1000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	241	241	241
	Container2000	Propulsion	22,469	2004	22	1	1	10.5	52	104	0.1%	1	1	1		0.1%	99	80	42	33			
	Container2000	Auxiliary	4,649			1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	42	33	981	2,180	1,035
	Container2000	Auxiliary Boiler				1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	42	33	325	325	325
	Container3000	Propulsion	29,107	1999	23	1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	42	33			
	Container3000	Auxiliary	3,919			1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	42	33	602	2,063	516
	Container3000	Auxiliary Boiler				1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	42	33	474	474	474
	Container4000	Propulsion	41,323	2000	24					0	0.1%				0	0.1%	0	0	0	0			
	Container4000	Auxiliary	7,058			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,434	2,523	1,161
	Container4000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	492	492	492
	Container5000	Propulsion	50,247	2002	25					0	0.1%					0.1%	0	0	0	0			
	Container5000	Auxiliary	8,228			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,176	4,200	1,008
	Container5000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	630	630	630
	Container6000	Propulsion	60,580	2006	25					0	0.1%					0.1%	0	0	0	0			
	Container6000	Auxiliary	10,631			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,425	2,178	986
	Container6000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	565	565	565
	Container7000	Propulsion	57,217	2006	25	0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0			
	Container7000	Auxiliary	10,771			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,539	3,434	1,066
	Container7000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	551	551	551
	Container8000	Propulsion	66,868	2006	25	1	1	19.0	52	104	0.1%	1				0.1%	99	80	42	33			
	Container8000	Auxiliary	10,911			1	1	19.0	52	104	0.1%	1	0	0	0	0.1%	99	80	42	33	1,416	3,158	980
	Container8000	Auxiliary Boiler				1	1	19.0	52	104	0.1%	1	0	0	0	0.1%	99	80	42	33	525	525	525
	Container9000	Propulsion	67,428	2007	25	0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0			
	Container9000	Auxiliary	11,520			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,502	3,350	1,040
	Container9000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	547	547	547
	Container10000	Propulsion	68,034	2007	25					0	0.1%		0			0.1%	0	0	0	0			
	Container10000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,751	3,675	1,270
	Container10000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	574	574	574
	Container11000	Propulsion	68,639	2008	25					0	0.1%					0.1%	0	0	0	0			
	Container11000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	2,000	4,000	1,500
	Container11000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	600	600	600
	Container12000	Propulsion	67,399	2010	25	1	1	19.0	50	100	0.1%					0.1%	95	77	40	32			
	Container12000	Auxiliary	na			1	1	19.0	50	100	0.1%	0	0	0	0	0.1%	95	77	40	32	2,500	4,500	2,000
	Container12000	Auxiliary Boiler				1	1	19.0	50	100	0.1%	0	0	0	0	0.1%	95	77	40	32	600	600	600
	Container13000	Propulsion																					
	Container13000	Auxiliary																					
	Container13000	Auxiliary Boiler																					
	Container14000	Propulsion																					
	Container14000	Auxiliary																					
	Container14000	Auxiliary Boiler																					
Total 2020						**4**	**4**		**206**	**412**		**3**	**2**	**2**	**0**		**391**	**317**	**165**	**132**			

Table B1.23 **Operational OGV Emissions Without Mitigation - Proposed Project and Alternatives**

			Vessel Characteristics			Activity															Average Auxiliary Load (kW)		
	Vessel Type	Engine/Source Type	Engine Rating (kW)	Vessel Year	Max Rated Speed (knots)	Peak Day Berth Calls	Peak Day Transits	Peak Day Hotelling Time Per Vessel (hr/day)	Annual Berth Calls	Annual Transits	Peak Day Fuel Sulfur	Peak Day Number of Transits in Compliance with VSRP in Zone 3	Peak Day Number of Transits in Compliance with VSRP in Zone 4	Peak Day Number of Vessels using AMP	Peak Day Number of Transits with Slide Valves	Annual Fuel Sulfur	Annual Number of Transits in Compliance with VSRP in Zone 3	Annual Number of Transits in Compliance with VSRP in Zone 4	Annual Number of Vessels using AMP	Annual Number of Transits with Slide Valves	Transit	Maneuvering	Berth/ Anchorage
Proposed Project																							
2026	Container1000	Propulsion	15,627	2004	20					0	0.1%					0.1%	0	0	0	0			
	Container1000	Auxiliary	4,421			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	396	942	297
	Container1000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	241	241	241
	Container2000	Propulsion	22,469	2004	22	1	1	10.5	52	104	0.1%	1	1	1		0.1%	99	80	42	33			
	Container2000	Auxiliary	4,649			1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	42	33	981	2,180	1,035
	Container2000	Auxiliary Boiler				1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	42	33	325	325	325
	Container3000	Propulsion	29,107	1999	23	1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	42	33			
	Container3000	Auxiliary	3,919			1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	42	33	602	2,063	516
	Container3000	Auxiliary Boiler				1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	42	33	474	474	474
	Container4000	Propulsion	41,323	2000	24					0	0.1%				0	0.1%	0	0	0	0			
	Container4000	Auxiliary	7,058			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,434	2,523	1,161
	Container4000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	492	492	492
	Container5000	Propulsion	50,247	2002	25					0	0.1%					0.1%	0	0	0	0			
	Container5000	Auxiliary	8,228			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,176	4,200	1,008
	Container5000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	630	630	630
	Container6000	Propulsion	60,580	2006	25					0	0.1%					0.1%	0	0	0	0			
	Container6000	Auxiliary	10,631			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,425	2,178	986
	Container6000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	565	565	565
	Container7000	Propulsion	57,217	2006	25	0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0			
	Container7000	Auxiliary	10,771			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,539	3,434	1,066
	Container7000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	551	551	551
	Container8000	Propulsion	66,868	2006	25	0	0	0.0	0	0	0.1%					0.1%	0	0	0	0			
	Container8000	Auxiliary	10,911			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,416	3,158	980
	Container8000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	525	525	525
	Container9000	Propulsion	67,428	2007	25	0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0			
	Container9000	Auxiliary	11,520			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,502	3,350	1,040
	Container9000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	547	547	547
	Container10000	Propulsion	68,034	2007	25	1	1	19.0	52	104	0.1%	1	0			0.1%	99	80	42	33			
	Container10000	Auxiliary	na			1	1	19.0	52	104	0.1%	1	0	0	0	0.1%	99	80	42	33	1,751	3,675	1,270
	Container10000	Auxiliary Boiler				1	1	19.0	52	104	0.1%	1	0	0	0	0.1%	99	80	42	33	574	574	574
	Container11000	Propulsion	68,639	2008	25					0	0.1%		0			0.1%	0	0	0	0			
	Container11000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	2,000	4,000	1,500
	Container11000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	600	600	600
	Container12000	Propulsion	67,399	2010	25	1	1	19.0	50	100	0.1%					0.1%	95	77	40	32			
	Container12000	Auxiliary	na			1	1	19.0	50	100	0.1%	0	0	0	0	0.1%	95	77	40	32	2,500	4,500	2,000
	Container12000	Auxiliary Boiler				1	1	19.0	50	100	0.1%	0	0	0	0	0.1%	95	77	40	32	600	600	600
	Container13000	Propulsion																					
	Container13000	Auxiliary																					
	Container13000	Auxiliary Boiler																					
	Container14000	Propulsion																					
	Container14000	Auxiliary																					
	Container14000	Auxiliary Boiler																					
Total 2026						**4**	**4**		**206**	**412**		**3**	**2**	**2**	**0**		**391**	**317**	**165**	**132**			

Table B1.23 **Operational OGV Emissions Without Mitigation - Proposed Project and Alternatives**

			Vessel Characteristics			Activity														Average Auxiliary Load (kW)		
	Vessel Type	Engine/Source Type	Engine Rating (kW)	Vessel Year	Max Rated Speed (knots)	Peak Day Berth Calls	Peak Day Transits	Peak Day Hotelling Time Per Vessel (hr/day)	Annual Berth Calls	Annual Transits	Peak Day Fuel Sulfur	Peak Day Number of Transits in Compliance with VSRP in Zone 3	Peak Day Number of Transits in Compliance with VSRP in Zone 4	Peak Day Number of Vessels using AMP	Peak Day Number of Transits with Slide Valves	Annual Fuel Sulfur	Annual Number of Transits in Compliance with VSRP in Zone 3	Annual Number of Transits in Compliance with VSRP in Zone 4	Annual Number of Vessels using AMP	Annual Number of Transits with Slide Valves	Transit	Maneuvering	Berth/ Anchorage
Alternative 1 No Project																						
2015	Container1000	Propulsion	15,627	2004	20					0	0.1%					0.1%	0	0	0	0		
	Container1000	Auxiliary	4,421			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	396	942	297
	Container1000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	241	241	241
	Container2000	Propulsion	22,469	2004	22	1	1	10.5	52	104	0.1%	1	1			0.1%	99	80	26	33			
	Container2000	Auxiliary	4,649			1	1	10.5	52	104	0.1%	1	1	0	0	0.1%	99	80	26	33	981	2,180	1,035
	Container2000	Auxiliary Boiler				1	1	10.5	52	104	0.1%	1	1	0	0	0.1%	99	80	26	33	325	325	325
	Container3000	Propulsion	29,107	1999	23	1	1	10.5	52	104	0.1%	1	1	0	0	0.1%	99	80	26	33			
	Container3000	Auxiliary	3,919			1	1	10.5	52	104	0.1%	1	1	0	0	0.1%	99	80	26	33	602	2,063	516
	Container3000	Auxiliary Boiler				1	1	10.5	52	104	0.1%	1	1	0	0	0.1%	99	80	26	33	474	474	474
	Container4000	Propulsion	41,323	2000	24					0	0.1%			0	0	0.1%	0	0	0	0			
	Container4000	Auxiliary	7,058			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,434	2,523	1,161
	Container4000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	492	492	492
	Container5000	Propulsion	50,247	2002	25					0	0.1%					0.1%	0	0	0	0			
	Container5000	Auxiliary	8,228			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,176	4,200	1,008
	Container5000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	630	630	630
	Container6000	Propulsion	60,580	2006	25	1	1	10.5	94	188	0.1%	1				0.1%	179	145	47	60			
	Container6000	Auxiliary	10,631			1	1	10.5	94	188	0.1%	1	0	0	0	0.1%	179	145	47	60	1,425	2,178	986
	Container6000	Auxiliary Boiler				1	1	10.5	94	188	0.1%	1	0	0	0	0.1%	179	145	47	60	565	565	565
	Container7000	Propulsion	57,217	2006	25	1	1	10.5	8	16	0.1%			0	0	0.1%	15	12	4	5			
	Container7000	Auxiliary	10,771			1	1	10.5	8	16	0.1%	0	0	0	0	0.1%	15	12	4	5	1,539	3,434	1,066
	Container7000	Auxiliary Boiler				1	1	10.5	8	16	0.1%	0	0	0	0	0.1%	15	12	4	5	551	551	551
	Container8000	Propulsion	66,868	2006	25					0	0.1%					0.1%	0	0	0	0			
	Container8000	Auxiliary	10,911			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,416	3,158	980
	Container8000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	525	525	525
	Container9000	Propulsion	67,428	2007	25	0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0			
	Container9000	Auxiliary	11,520			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,502	3,350	1,040
	Container9000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	547	547	547
	Container10000	Propulsion	68,034	2007	25					0	0.1%					0.1%	0	0	0	0			
	Container10000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,751	3,675	1,270
	Container10000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	574	574	574
	Container11000	Propulsion	68,639	2008	25					0	0.1%					0.1%	0	0	0	0			
	Container11000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	2,000	4,000	1,500
	Container11000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	600	600	600
	Container12000	Propulsion	67,399	2010	25					0	0.1%					0.1%	0	0	0	0			
	Container12000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	2,500	4,500	2,000
	Container12000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	600	600	600
	Container13000	Propulsion																					
	Container13000	Auxiliary																					
	Container13000	Auxiliary Boiler																					
	Container14000	Propulsion																					
	Container14000	Auxiliary																					
	Container14000	Auxiliary Boiler																					
Total 2015						**4**	**4**		**206**	**412**		**3**	**2**	**0**	**0**		**391**	**317**	**103**	**132**			

Table B1.23 **Operational OGV Emissions Without Mitigation - Proposed Project and Alternatives**

			Vessel Characteristics			Activity														Average Auxiliary Load (kW)		
	Vessel Type	Engine/Source Type	Engine Rating (kW)	Vessel Year	Max Rated Speed (knots)	Peak Day Berth Calls	Peak Day Transits	Peak Day Hotelling Time Per Vessel (hr/day)	Annual Berth Calls	Annual Transits	Peak Day Fuel Sulfur	Peak Day Number of Transits in Compliance with VSRP in Zone 3	Peak Day Number of Transits in Compliance with VSRP in Zone 4	Peak Day Number of Vessels using AMP	Peak Day Number of Transits with Slide Valves	Annual Fuel Sulfur	Annual Number of Transits in Compliance with VSRP in Zone 3	Annual Number of Transits in Compliance with VSRP in Zone 4	Annual Number of Vessels using AMP	Annual Number of Transits with Slide Valves	Transit	Maneuvering	Berth/ Anchorage
Alternative 1 No Project																						
2016	Container1000	Propulsion	15,627	2004	20					0	0.1%					0.1%	0	0	0	0		
	Container1000	Auxiliary	4,421			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	396	942	297
	Container1000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	241	241	241
	Container2000	Propulsion	22,469	2004	22	1	1	10.5	52	104	0.1%	1	1			0.1%	99	80	26	33			
	Container2000	Auxiliary	4,649			1	1	10.5	52	104	0.1%	1	1	0	0	0.1%	99	80	26	33	981	2,180	1,035
	Container2000	Auxiliary Boiler				1	1	10.5	52	104	0.1%	1	1	0	0	0.1%	99	80	26	33	325	325	325
	Container3000	Propulsion	29,107	1999	23	1	1	10.5	52	104	0.1%	1	1	0	0	0.1%	99	80	26	33			
	Container3000	Auxiliary	3,919			1	1	10.5	52	104	0.1%	1	1	0	0	0.1%	99	80	26	33	602	2,063	516
	Container3000	Auxiliary Boiler				1	1	10.5	52	104	0.1%	1	1	0	0	0.1%	99	80	26	33	474	474	474
	Container4000	Propulsion	41,323	2000	24					0	0.1%			0	0	0.1%	0	0	0	0			
	Container4000	Auxiliary	7,058			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,434	2,523	1,161
	Container4000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	492	492	492
	Container5000	Propulsion	50,247	2002	25					0	0.1%					0.1%	0	0	0	0			
	Container5000	Auxiliary	8,228			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,176	4,200	1,008
	Container5000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	630	630	630
	Container6000	Propulsion	60,580	2006	25	1	1	10.5	94	188	0.1%	1				0.1%	179	145	47	60			
	Container6000	Auxiliary	10,631			1	1	10.5	94	188	0.1%	1	0	0	0	0.1%	179	145	47	60	1,425	2,178	986
	Container6000	Auxiliary Boiler				1	1	10.5	94	188	0.1%	1	0	0	0	0.1%	179	145	47	60	565	565	565
	Container7000	Propulsion	57,217	2006	25	1	1	10.5	8	16	0.1%			0	0	0.1%	15	12	4	5			
	Container7000	Auxiliary	10,771			1	1	10.5	8	16	0.1%	0	0	0	0	0.1%	15	12	4	5	1,539	3,434	1,066
	Container7000	Auxiliary Boiler				1	1	10.5	8	16	0.1%	0	0	0	0	0.1%	15	12	4	5	551	551	551
	Container8000	Propulsion	66,868	2006	25					0	0.1%					0.1%	0	0	0	0			
	Container8000	Auxiliary	10,911			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,416	3,158	980
	Container8000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	525	525	525
	Container9000	Propulsion	67,428	2007	25	0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0			
	Container9000	Auxiliary	11,520			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,502	3,350	1,040
	Container9000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	547	547	547
	Container10000	Propulsion	68,034	2007	25					0	0.1%					0.1%	0	0	0	0			
	Container10000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,751	3,675	1,270
	Container10000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	574	574	574
	Container11000	Propulsion	68,639	2008	25					0	0.1%					0.1%	0	0	0	0			
	Container11000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	2,000	4,000	1,500
	Container11000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	600	600	600
	Container12000	Propulsion	67,399	2010	25					0	0.1%					0.1%	0	0	0	0			
	Container12000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	2,500	4,500	2,000
	Container12000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	600	600	600
	Container13000	Propulsion																					
	Container13000	Auxiliary																					
	Container13000	Auxiliary Boiler																					
	Container14000	Propulsion																					
	Container14000	Auxiliary																					
	Container14000	Auxiliary Boiler																					
Total 2016						**4**	**4**		**206**	**412**		**3**	**2**	**0**	**0**		**391**	**317**	**103**	**132**			

Table B1.23 **Operational OGV Emissions Without Mitigation - Proposed Project and Alternatives**

			Vessel Characteristics			Activity															Average Auxiliary Load (kW)		
	Vessel Type	Engine/Source Type	Engine Rating (kW)	Vessel Year	Max Rated Speed (knots)	Peak Day Berth Calls	Peak Day Transits	Peak Day Hotelling Time Per Vessel (hr/day)	Annual Berth Calls	Annual Transits	Peak Day Fuel Sulfur	Peak Day Number of Transits in Compliance with VSRP in Zone 3	Peak Day Number of Transits in Compliance with VSRP in Zone 4	Peak Day Number of Vessels using AMP	Peak Day Number of Transits with Slide Valves	Annual Fuel Sulfur	Annual Number of Transits in Compliance with VSRP in Zone 3	Annual Number of Transits in Compliance with VSRP in Zone 4	Annual Number of Vessels using AMP	Annual Number of Transits with Slide Valves	Transit	Maneuvering	Berth/ Anchorage
Alternative 1 No Project																							
2017	Container1000	Propulsion	15,627	2004	20					0	0.1%					0.1%	0	0	0	0			
	Container1000	Auxiliary	4,421			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	396	942	297
	Container1000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	241	241	241
	Container2000	Propulsion	22,469	2004	22	1	1	10.5	52	104	0.1%	1	1	1		0.1%	99	80	36	33			
	Container2000	Auxiliary	4,649			1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	36	33	981	2,180	1,035
	Container2000	Auxiliary Boiler				1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	36	33	325	325	325
	Container3000	Propulsion	29,107	1999	23	1	1	10.5	52	104	0.1%	1	1		0	0.1%	99	80	36	33			
	Container3000	Auxiliary	3,919			1	1	10.5	52	104	0.1%	1	1	0	0	0.1%	99	80	36	33	602	2,063	516
	Container3000	Auxiliary Boiler				1	1	10.5	52	104	0.1%	1	1	0	0	0.1%	99	80	36	33	474	474	474
	Container4000	Propulsion	41,323	2000	24					0	0.1%			0	0	0.1%	0	0	0	0			
	Container4000	Auxiliary	7,058			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,434	2,523	1,161
	Container4000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	492	492	492
	Container5000	Propulsion	50,247	2002	25					0	0.1%					0.1%	0	0	0	0			
	Container5000	Auxiliary	8,228			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,176	4,200	1,008
	Container5000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	630	630	630
	Container6000	Propulsion	60,580	2006	25	1	1	10.5	52	104	0.1%	1				0.1%	99	80	36	33			
	Container6000	Auxiliary	10,631			1	1	10.5	52	104	0.1%	1	0	0	0	0.1%	99	80	36	33	1,425	2,178	986
	Container6000	Auxiliary Boiler				1	1	10.5	52	104	0.1%	1	0	0	0	0.1%	99	80	36	33	565	565	565
	Container7000	Propulsion	57,217	2006	25					0	0.1%		0	0	0	0.1%	0	0	0	0			
	Container7000	Auxiliary	10,771			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,539	3,434	1,066
	Container7000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	551	551	551
	Container8000	Propulsion	66,868	2006	25	1	1	10.5	50	100	0.1%					0.1%	95	77	35	32			
	Container8000	Auxiliary	10,911			1	1	10.5	50	100	0.1%	0	0	0	0	0.1%	95	77	35	32	1,416	3,158	980
	Container8000	Auxiliary Boiler				1	1	10.5	50	100	0.1%	0	0	0	0	0.1%	95	77	35	32	525	525	525
	Container9000	Propulsion	67,428	2007	25	0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0			
	Container9000	Auxiliary	11,520			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,502	3,350	1,040
	Container9000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	547	547	547
	Container10000	Propulsion	68,034	2007	25					0	0.1%					0.1%	0	0	0	0			
	Container10000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,751	3,675	1,270
	Container10000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	574	574	574
	Container11000	Propulsion	68,639	2008	25					0	0.1%					0.1%	0	0	0	0			
	Container11000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	2,000	4,000	1,500
	Container11000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	600	600	600
	Container12000	Propulsion	67,399	2010	25					0	0.1%					0.1%	0	0	0	0			
	Container12000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	2,500	4,500	2,000
	Container12000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	600	600	600
	Container13000	Propulsion																					
	Container13000	Auxiliary																					
	Container13000	Auxiliary Boiler																					
	Container14000	Propulsion																					
	Container14000	Auxiliary																					
	Container14000	Auxiliary Boiler																					
Total 2017						**4**	**4**		**206**	**412**		**3**	**2**	**1**	**0**		**391**	**317**	**144**	**132**			

Table B1.23 **Operational OGV Emissions Without Mitigation - Proposed Project and Alternatives**

			Vessel Characteristics			Activity															Average Auxiliary Load (kW)		
	Vessel Type	Engine/Source Type	Engine Rating (kW)	Vessel Year	Max Rated Speed (knots)	Peak Day Berth Calls	Peak Day Transits	Peak Day Hotelling Time Per Vessel (hr/day)	Annual Berth Calls	Annual Transits	Peak Day Fuel Sulfur	Peak Day Number of Transits in Compliance with VSRP in Zone 3	Peak Day Number of Transits in Compliance with VSRP in Zone 4	Peak Day Number of Vessels using AMP	Peak Day Number of Transits with Slide Valves	Annual Fuel Sulfur	Annual Number of Transits in Compliance with VSRP in Zone 3	Annual Number of Transits in Compliance with VSRP in Zone 4	Annual Number of Vessels using AMP	Annual Number of Transits with Slide Valves	Transit	Maneuvering	Berth/ Anchorage
Alternative 1 No Project																							
2020	Container1000	Propulsion	15,627	2004	20					0	0.1%					0.1%	0	0	0	0			
	Container1000	Auxiliary	4,421			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	396	942	297
	Container1000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	241	241	241
	Container2000	Propulsion	22,469	2004	22	1	1	10.5	52	104	0.1%	1	1	1		0.1%	99	80	42	33			
	Container2000	Auxiliary	4,649			1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	42	33	981	2,180	1,035
	Container2000	Auxiliary Boiler				1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	42	33	325	325	325
	Container3000	Propulsion	29,107	1999	23	1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	42	33			
	Container3000	Auxiliary	3,919			1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	42	33	602	2,063	516
	Container3000	Auxiliary Boiler				1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	42	33	474	474	474
	Container4000	Propulsion	41,323	2000	24					0	0.1%				0	0.1%	0	0	0	0			
	Container4000	Auxiliary	7,058			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,434	2,523	1,161
	Container4000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	492	492	492
	Container5000	Propulsion	50,247	2002	25					0	0.1%					0.1%	0	0	0	0			
	Container5000	Auxiliary	8,228			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,176	4,200	1,008
	Container5000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	630	630	630
	Container6000	Propulsion	60,580	2006	25					0	0.1%					0.1%	0	0	0	0			
	Container6000	Auxiliary	10,631			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,425	2,178	986
	Container6000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	565	565	565
	Container7000	Propulsion	57,217	2006	25	0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0			
	Container7000	Auxiliary	10,771			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,539	3,434	1,066
	Container7000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	551	551	551
	Container8000	Propulsion	66,868	2006	25	2	2	10.5	102	204	0.1%	1				0.1%	194	157	82	65			
	Container8000	Auxiliary	10,911			2	2	10.5	102	204	0.1%	1	0	0	0	0.1%	194	157	82	65	1,416	3,158	980
	Container8000	Auxiliary Boiler				2	2	10.5	102	204	0.1%	1	0	0	0	0.1%	194	157	82	65	525	525	525
	Container9000	Propulsion	67,428	2007	25	0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0			
	Container9000	Auxiliary	11,520			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,502	3,350	1,040
	Container9000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	547	547	547
	Container10000	Propulsion	68,034	2007	25					0	0.1%		0			0.1%	0	0	0	0			
	Container10000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,751	3,675	1,270
	Container10000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	574	574	574
	Container11000	Propulsion	68,639	2008	25					0	0.1%					0.1%	0	0	0	0			
	Container11000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	2,000	4,000	1,500
	Container11000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	600	600	600
	Container12000	Propulsion	67,399	2010	25					0	0.1%					0.1%	0	0	0	0			
	Container12000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	2,500	4,500	2,000
	Container12000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	600	600	600
	Container13000	Propulsion																					
	Container13000	Auxiliary																					
	Container13000	Auxiliary Boiler																					
	Container14000	Propulsion																					
	Container14000	Auxiliary																					
	Container14000	Auxiliary Boiler																					
Total 2020						**4**	**4**		**206**	**412**		**3**	**2**	**2**	**0**		**391**	**317**	**165**	**132**			

Table B1.23 **Operational OGV Emissions Without Mitigation - Proposed Project and Alternatives**

			Vessel Characteristics			Activity															Average Auxiliary Load (kW)		
	Vessel Type	Engine/Source Type	Engine Rating (kW)	Vessel Year	Max Rated Speed (knots)	Peak Day Berth Calls	Peak Day Transits	Peak Day Hotelling Time Per Vessel (hr/day)	Annual Berth Calls	Annual Transits	Peak Day Fuel Sulfur	Peak Day Number of Transits in Compliance with VSRP in Zone 3	Peak Day Number of Transits in Compliance with VSRP in Zone 4	Peak Day Number of Vessels using AMP	Peak Day Number of Transits with Slide Valves	Annual Fuel Sulfur	Annual Number of Transits in Compliance with VSRP in Zone 3	Annual Number of Transits in Compliance with VSRP in Zone 4	Annual Number of Vessels using AMP	Annual Number of Transits with Slide Valves	Transit	Maneuvering	Berth/ Anchorage
Alternative 1 No Project																							
2026	Container1000	Propulsion	15,627	2004	20					0	0.1%					0.1%	0	0	0	0			
	Container1000	Auxiliary	4,421			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	396	942	297
	Container1000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	241	241	241
	Container2000	Propulsion	22,469	2004	22	1	1	10.5	52	104	0.1%	1	1	1		0.1%	99	80	42	33			
	Container2000	Auxiliary	4,649			1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	42	33	981	2,180	1,035
	Container2000	Auxiliary Boiler				1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	42	33	325	325	325
	Container3000	Propulsion	29,107	1999	23	1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	42	33			
	Container3000	Auxiliary	3,919			1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	42	33	602	2,063	516
	Container3000	Auxiliary Boiler				1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	42	33	474	474	474
	Container4000	Propulsion	41,323	2000	24					0	0.1%				0	0.1%	0	0	0	0			
	Container4000	Auxiliary	7,058			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,434	2,523	1,161
	Container4000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	492	492	492
	Container5000	Propulsion	50,247	2002	25					0	0.1%					0.1%	0	0	0	0			
	Container5000	Auxiliary	8,228			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,176	4,200	1,008
	Container5000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	630	630	630
	Container6000	Propulsion	60,580	2006	25					0	0.1%					0.1%	0	0	0	0			
	Container6000	Auxiliary	10,631			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,425	2,178	986
	Container6000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	565	565	565
	Container7000	Propulsion	57,217	2006	25	0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0			
	Container7000	Auxiliary	10,771			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,539	3,434	1,066
	Container7000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	551	551	551
	Container8000	Propulsion	66,868	2006	25	2	2	10.5	102	204	0.1%	1				0.1%	194	157	82	65			
	Container8000	Auxiliary	10,911			2	2	10.5	102	204	0.1%	1	0	0	0	0.1%	194	157	82	65	1,416	3,158	980
	Container8000	Auxiliary Boiler				2	2	10.5	102	204	0.1%	1	0	0	0	0.1%	194	157	82	65	525	525	525
	Container9000	Propulsion	67,428	2007	25	0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0			
	Container9000	Auxiliary	11,520			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,502	3,350	1,040
	Container9000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	547	547	547
	Container10000	Propulsion	68,034	2007	25					0	0.1%		0			0.1%	0	0	0	0			
	Container10000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,751	3,675	1,270
	Container10000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	574	574	574
	Container11000	Propulsion	68,639	2008	25					0	0.1%		0			0.1%	0	0	0	0			
	Container11000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	2,000	4,000	1,500
	Container11000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	600	600	600
	Container12000	Propulsion	67,399	2010	25					0	0.1%					0.1%	0	0	0	0			
	Container12000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	2,500	4,500	2,000
	Container12000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	600	600	600
	Container13000	Propulsion																					
	Container13000	Auxiliary																					
	Container13000	Auxiliary Boiler																					
	Container14000	Propulsion																					
	Container14000	Auxiliary																					
	Container14000	Auxiliary Boiler																					
Total 2026						**4**	**4**		**206**	**412**		**3**	**2**	**2**	**0**		**391**	**317**	**165**	**132**			

Table B1.23 **Operational OGV Emissions Without Mitigation - Proposed Project and Alternatives**

			Vessel Characteristics			Activity														Average Auxiliary Load (kW)		
	Vessel Type	Engine/Source Type	Engine Rating (kW)	Vessel Year	Max Rated Speed (knots)	Peak Day Berth Calls	Peak Day Transits	Peak Day Hotelling Time Per Vessel (hr/day)	Annual Berth Calls	Annual Transits	Peak Day Fuel Sulfur	Peak Day Number of Transits in Compliance with VSRP in Zone 3	Peak Day Number of Transits in Compliance with VSRP in Zone 4	Peak Day Number of Vessels using AMP	Peak Day Number of Transits with Slide Valves	Annual Fuel Sulfur	Annual Number of Transits in Compliance with VSRP in Zone 3	Annual Number of Transits in Compliance with VSRP in Zone 4	Annual Number of Vessels using AMP	Annual Number of Transits with Slide Valves	Transit	Maneuvering	Berth/ Anchorage
Alternative 2 No Federal Action																						
2015	Container1000	Propulsion	15,627	2004	20					0	0.1%					0.1%	0	0	0	0		
	Container1000	Auxiliary	4,421			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	396	942	297
	Container1000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	241	241	241
	Container2000	Propulsion	22,469	2004	22	1	1	10.5	52	104	0.1%	1	1			0.1%	99	80	26	33			
	Container2000	Auxiliary	4,649			1	1	10.5	52	104	0.1%	1	1	0	0	0.1%	99	80	26	33	981	2,180	1,035
	Container2000	Auxiliary Boiler				1	1	10.5	52	104	0.1%	1	1	0	0	0.1%	99	80	26	33	325	325	325
	Container3000	Propulsion	29,107	1999	23	1	1	10.5	52	104	0.1%	1	1	0	0	0.1%	99	80	26	33			
	Container3000	Auxiliary	3,919			1	1	10.5	52	104	0.1%	1	1	0	0	0.1%	99	80	26	33	602	2,063	516
	Container3000	Auxiliary Boiler				1	1	10.5	52	104	0.1%	1	1	0	0	0.1%	99	80	26	33	474	474	474
	Container4000	Propulsion	41,323	2000	24					0	0.1%			0	0	0.1%	0	0	0	0			
	Container4000	Auxiliary	7,058			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,434	2,523	1,161
	Container4000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	492	492	492
	Container5000	Propulsion	50,247	2002	25					0	0.1%					0.1%	0	0	0	0			
	Container5000	Auxiliary	8,228			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,176	4,200	1,008
	Container5000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	630	630	630
	Container6000	Propulsion	60,580	2006	25	1	1	10.5	94	188	0.1%	1				0.1%	179	145	47	60			
	Container6000	Auxiliary	10,631			1	1	10.5	94	188	0.1%	1	0	0	0	0.1%	179	145	47	60	1,425	2,178	986
	Container6000	Auxiliary Boiler				1	1	10.5	94	188	0.1%	1	0	0	0	0.1%	179	145	47	60	565	565	565
	Container7000	Propulsion	57,217	2006	25	1	1	10.5	8	16	0.1%			0	0	0.1%	15	12	4	5			
	Container7000	Auxiliary	10,771			1	1	10.5	8	16	0.1%	0	0	0	0	0.1%	15	12	4	5	1,539	3,434	1,066
	Container7000	Auxiliary Boiler				1	1	10.5	8	16	0.1%	0	0	0	0	0.1%	15	12	4	5	551	551	551
	Container8000	Propulsion	66,868	2006	25					0	0.1%					0.1%	0	0	0	0			
	Container8000	Auxiliary	10,911			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,416	3,158	980
	Container8000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	525	525	525
	Container9000	Propulsion	67,428	2007	25	0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0			
	Container9000	Auxiliary	11,520			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,502	3,350	1,040
	Container9000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	547	547	547
	Container10000	Propulsion	68,034	2007	25					0	0.1%					0.1%	0	0	0	0			
	Container10000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,751	3,675	1,270
	Container10000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	574	574	574
	Container11000	Propulsion	68,639	2008	25					0	0.1%					0.1%	0	0	0	0			
	Container11000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	2,000	4,000	1,500
	Container11000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	600	600	600
	Container12000	Propulsion	67,399	2010	25					0	0.1%					0.1%	0	0	0	0			
	Container12000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	2,500	4,500	2,000
	Container12000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	600	600	600
	Container13000	Propulsion																					
	Container13000	Auxiliary																					
	Container13000	Auxiliary Boiler																					
	Container14000	Propulsion																					
	Container14000	Auxiliary																					
	Container14000	Auxiliary Boiler																					
Total 2015						**4**	**4**		**206**	**412**		**3**	**2**	**0**	**0**		**391**	**317**	**103**	**132**			

Table B1.23 **Operational OGV Emissions Without Mitigation - Proposed Project and Alternatives**

			Vessel Characteristics			Activity														Average Auxiliary Load (kW)		
	Vessel Type	Engine/Source Type	Engine Rating (kW)	Vessel Year	Max Rated Speed (knots)	Peak Day Berth Calls	Peak Day Transits	Peak Day Hotelling Time Per Vessel (hr/day)	Annual Berth Calls	Annual Transits	Peak Day Fuel Sulfur	Peak Day Number of Transits in Compliance with VSRP in Zone 3	Peak Day Number of Transits in Compliance with VSRP in Zone 4	Peak Day Number of Vessels using AMP	Peak Day Number of Transits with Slide Valves	Annual Fuel Sulfur	Annual Number of Transits in Compliance with VSRP in Zone 3	Annual Number of Transits in Compliance with VSRP in Zone 4	Annual Number of Vessels using AMP	Annual Number of Transits with Slide Valves	Transit	Maneuvering	Berth/ Anchorage
Alternative 2 No Federal Action																						
2016	Container1000	Propulsion	15,627	2004	20					0	0.1%					0.1%	0	0	0	0		
	Container1000	Auxiliary	4,421			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	396	942	297
	Container1000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	241	241	241
	Container2000	Propulsion	22,469	2004	22	1	1	10.5	52	104	0.1%	1	1			0.1%	99	80	26	33			
	Container2000	Auxiliary	4,649			1	1	10.5	52	104	0.1%	1	1	0	0	0.1%	99	80	26	33	981	2,180	1,035
	Container2000	Auxiliary Boiler				1	1	10.5	52	104	0.1%	1	1	0	0	0.1%	99	80	26	33	325	325	325
	Container3000	Propulsion	29,107	1999	23	1	1	10.5	52	104	0.1%	1	1	0	0	0.1%	99	80	26	33			
	Container3000	Auxiliary	3,919			1	1	10.5	52	104	0.1%	1	1	0	0	0.1%	99	80	26	33	602	2,063	516
	Container3000	Auxiliary Boiler				1	1	10.5	52	104	0.1%	1	1	0	0	0.1%	99	80	26	33	474	474	474
	Container4000	Propulsion	41,323	2000	24					0	0.1%			0	0	0.1%	0	0	0	0			
	Container4000	Auxiliary	7,058			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,434	2,523	1,161
	Container4000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	492	492	492
	Container5000	Propulsion	50,247	2002	25					0	0.1%					0.1%	0	0	0	0			
	Container5000	Auxiliary	8,228			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,176	4,200	1,008
	Container5000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	630	630	630
	Container6000	Propulsion	60,580	2006	25	1	1	10.5	94	188	0.1%	1				0.1%	179	145	47	60			
	Container6000	Auxiliary	10,631			1	1	10.5	94	188	0.1%	1	0	0	0	0.1%	179	145	47	60	1,425	2,178	986
	Container6000	Auxiliary Boiler				1	1	10.5	94	188	0.1%	1	0	0	0	0.1%	179	145	47	60	565	565	565
	Container7000	Propulsion	57,217	2006	25	1	1	10.5	8	16	0.1%			0	0	0.1%	15	12	4	5			
	Container7000	Auxiliary	10,771			1	1	10.5	8	16	0.1%	0	0	0	0	0.1%	15	12	4	5	1,539	3,434	1,066
	Container7000	Auxiliary Boiler				1	1	10.5	8	16	0.1%	0	0	0	0	0.1%	15	12	4	5	551	551	551
	Container8000	Propulsion	66,868	2006	25					0	0.1%					0.1%	0	0	0	0			
	Container8000	Auxiliary	10,911			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,416	3,158	980
	Container8000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	525	525	525
	Container9000	Propulsion	67,428	2007	25	0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0			
	Container9000	Auxiliary	11,520			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,502	3,350	1,040
	Container9000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	547	547	547
	Container10000	Propulsion	68,034	2007	25					0	0.1%					0.1%	0	0	0	0			
	Container10000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,751	3,675	1,270
	Container10000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	574	574	574
	Container11000	Propulsion	68,639	2008	25					0	0.1%					0.1%	0	0	0	0			
	Container11000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	2,000	4,000	1,500
	Container11000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	600	600	600
	Container12000	Propulsion	67,399	2010	25					0	0.1%					0.1%	0	0	0	0			
	Container12000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	2,500	4,500	2,000
	Container12000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	600	600	600
	Container13000	Propulsion																					
	Container13000	Auxiliary																					
	Container13000	Auxiliary Boiler																					
	Container14000	Propulsion																					
	Container14000	Auxiliary																					
	Container14000	Auxiliary Boiler																					
Total 2016						**4**	**4**		**206**	**412**		**3**	**2**	**0**	**0**		**391**	**317**	**103**	**132**			

Table B1.23 **Operational OGV Emissions Without Mitigation - Proposed Project and Alternatives**

			Vessel Characteristics			Activity														Average Auxiliary Load (kW)		
	Vessel Type	Engine/Source Type	Engine Rating (kW)	Vessel Year	Max Rated Speed (knots)	Peak Day Berth Calls	Peak Day Transits	Peak Day Hotelling Time Per Vessel (hr/day)	Annual Berth Calls	Annual Transits	Peak Day Fuel Sulfur	Peak Day Number of Transits in Compliance with VSRP in Zone 3	Peak Day Number of Transits in Compliance with VSRP in Zone 4	Peak Day Number of Vessels using AMP	Peak Day Number of Transits with Slide Valves	Annual Fuel Sulfur	Annual Number of Transits in Compliance with VSRP in Zone 3	Annual Number of Transits in Compliance with VSRP in Zone 4	Annual Number of Vessels using AMP	Annual Number of Transits with Slide Valves	Transit	Maneuvering	Berth/ Anchorage
Alternative 2 No Federal Action																						
2017	Container1000	Propulsion	15,627	2004	20					0	0.1%					0.1%	0	0	0	0		
	Container1000	Auxiliary	4,421			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	396	942	297
	Container1000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	241	241	241
	Container2000	Propulsion	22,469	2004	22	1	1	10.5	52	104	0.1%	1	1	1		0.1%	99	80	36	33			
	Container2000	Auxiliary	4,649			1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	36	33	981	2,180	1,035
	Container2000	Auxiliary Boiler				1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	36	33	325	325	325
	Container3000	Propulsion	29,107	1999	23	1	1	10.5	52	104	0.1%	1	1		0	0.1%	99	80	36	33			
	Container3000	Auxiliary	3,919			1	1	10.5	52	104	0.1%	1	1	0	0	0.1%	99	80	36	33	602	2,063	516
	Container3000	Auxiliary Boiler				1	1	10.5	52	104	0.1%	1	1	0	0	0.1%	99	80	36	33	474	474	474
	Container4000	Propulsion	41,323	2000	24					0	0.1%			0	0	0.1%	0	0	0	0			
	Container4000	Auxiliary	7,058			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,434	2,523	1,161
	Container4000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	492	492	492
	Container5000	Propulsion	50,247	2002	25					0	0.1%					0.1%	0	0	0	0			
	Container5000	Auxiliary	8,228			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,176	4,200	1,008
	Container5000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	630	630	630
	Container6000	Propulsion	60,580	2006	25	1	1	10.5	52	104	0.1%	1				0.1%	99	80	36	33			
	Container6000	Auxiliary	10,631			1	1	10.5	52	104	0.1%	1	0	0	0	0.1%	99	80	36	33	1,425	2,178	986
	Container6000	Auxiliary Boiler				1	1	10.5	52	104	0.1%	1	0	0	0	0.1%	99	80	36	33	565	565	565
	Container7000	Propulsion	57,217	2006	25					0	0.1%		0	0	0	0.1%	0	0	0	0			
	Container7000	Auxiliary	10,771			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,539	3,434	1,066
	Container7000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	551	551	551
	Container8000	Propulsion	66,868	2006	25	1	1	10.5	50	100	0.1%					0.1%	95	77	35	32			
	Container8000	Auxiliary	10,911			1	1	10.5	50	100	0.1%	0	0	0	0	0.1%	95	77	35	32	1,416	3,158	980
	Container8000	Auxiliary Boiler				1	1	10.5	50	100	0.1%	0	0	0	0	0.1%	95	77	35	32	525	525	525
	Container9000	Propulsion	67,428	2007	25	0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0			
	Container9000	Auxiliary	11,520			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,502	3,350	1,040
	Container9000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	547	547	547
	Container10000	Propulsion	68,034	2007	25					0	0.1%					0.1%	0	0	0	0			
	Container10000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,751	3,675	1,270
	Container10000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	574	574	574
	Container11000	Propulsion	68,639	2008	25					0	0.1%					0.1%	0	0	0	0			
	Container11000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	2,000	4,000	1,500
	Container11000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	600	600	600
	Container12000	Propulsion	67,399	2010	25					0	0.1%					0.1%	0	0	0	0			
	Container12000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	2,500	4,500	2,000
	Container12000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	600	600	600
	Container13000	Propulsion																					
	Container13000	Auxiliary																					
	Container13000	Auxiliary Boiler																					
	Container14000	Propulsion																					
	Container14000	Auxiliary																					
	Container14000	Auxiliary Boiler																					
Total 2017						**4**	**4**		**206**	**412**		**3**	**2**	**1**	**0**		**391**	**317**	**144**	**132**			

Table B1.23 **Operational OGV Emissions Without Mitigation - Proposed Project and Alternatives**

			Vessel Characteristics			Activity															Average Auxiliary Load (kW)		
	Vessel Type	Engine/Source Type	Engine Rating (kW)	Vessel Year	Max Rated Speed (knots)	Peak Day Berth Calls	Peak Day Transits	Peak Day Hotelling Time Per Vessel (hr/day)	Annual Berth Calls	Annual Transits	Peak Day Fuel Sulfur	Peak Day Number of Transits in Compliance with VSRP in Zone 3	Peak Day Number of Transits in Compliance with VSRP in Zone 4	Peak Day Number of Vessels using AMP	Peak Day Number of Transits with Slide Valves	Annual Fuel Sulfur	Annual Number of Transits in Compliance with VSRP in Zone 3	Annual Number of Transits in Compliance with VSRP in Zone 4	Annual Number of Vessels using AMP	Annual Number of Transits with Slide Valves	Transit	Maneuvering	Berth/ Anchorage
Alternative 2 No Federal Action																							
2020	Container1000	Propulsion	15,627	2004	20					0	0.1%					0.1%	0	0	0	0			
	Container1000	Auxiliary	4,421			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	396	942	297
	Container1000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	241	241	241
	Container2000	Propulsion	22,469	2004	22	1	1	10.5	52	104	0.1%	1	1	1		0.1%	99	80	42	33			
	Container2000	Auxiliary	4,649			1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	42	33	981	2,180	1,035
	Container2000	Auxiliary Boiler				1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	42	33	325	325	325
	Container3000	Propulsion	29,107	1999	23	1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	42	33			
	Container3000	Auxiliary	3,919			1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	42	33	602	2,063	516
	Container3000	Auxiliary Boiler				1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	42	33	474	474	474
	Container4000	Propulsion	41,323	2000	24					0	0.1%				0	0.1%	0	0	0	0			
	Container4000	Auxiliary	7,058			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,434	2,523	1,161
	Container4000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	492	492	492
	Container5000	Propulsion	50,247	2002	25					0	0.1%					0.1%	0	0	0	0			
	Container5000	Auxiliary	8,228			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,176	4,200	1,008
	Container5000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	630	630	630
	Container6000	Propulsion	60,580	2006	25					0	0.1%					0.1%	0	0	0	0			
	Container6000	Auxiliary	10,631			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,425	2,178	986
	Container6000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	565	565	565
	Container7000	Propulsion	57,217	2006	25	0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0			
	Container7000	Auxiliary	10,771			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,539	3,434	1,066
	Container7000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	551	551	551
	Container8000	Propulsion	66,868	2006	25	2	2	10.5	102	204	0.1%	1				0.1%	194	157	82	65			
	Container8000	Auxiliary	10,911			2	2	10.5	102	204	0.1%	1	0	0	0	0.1%	194	157	82	65	1,416	3,158	980
	Container8000	Auxiliary Boiler				2	2	10.5	102	204	0.1%	1	0	0	0	0.1%	194	157	82	65	525	525	525
	Container9000	Propulsion	67,428	2007	25	0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0			
	Container9000	Auxiliary	11,520			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,502	3,350	1,040
	Container9000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	547	547	547
	Container10000	Propulsion	68,034	2007	25					0	0.1%		0			0.1%	0	0	0	0			
	Container10000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,751	3,675	1,270
	Container10000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	574	574	574
	Container11000	Propulsion	68,639	2008	25					0	0.1%					0.1%	0	0	0	0			
	Container11000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	2,000	4,000	1,500
	Container11000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	600	600	600
	Container12000	Propulsion	67,399	2010	25					0	0.1%					0.1%	0	0	0	0			
	Container12000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	2,500	4,500	2,000
	Container12000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	600	600	600
	Container13000	Propulsion																					
	Container13000	Auxiliary																					
	Container13000	Auxiliary Boiler																					
	Container14000	Propulsion																					
	Container14000	Auxiliary																					
	Container14000	Auxiliary Boiler																					
Total 2020						**4**	**4**		**206**	**412**		**3**	**2**	**2**	**0**		**391**	**317**	**165**	**132**			

Table B1.23 **Operational OGV Emissions Without Mitigation - Proposed Project and Alternatives**

			Vessel Characteristics			Activity														Average Auxiliary Load (kW)		
	Vessel Type	Engine/Source Type	Engine Rating (kW)	Vessel Year	Max Rated Speed (knots)	Peak Day Berth Calls	Peak Day Transits	Peak Day Hotelling Time Per Vessel (hr/day)	Annual Berth Calls	Annual Transits	Peak Day Fuel Sulfur	Peak Day Number of Transits in Compliance with VSRP in Zone 3	Peak Day Number of Transits in Compliance with VSRP in Zone 4	Peak Day Number of Vessels using AMP	Peak Day Number of Transits with Slide Valves	Annual Fuel Sulfur	Annual Number of Transits in Compliance with VSRP in Zone 3	Annual Number of Transits in Compliance with VSRP in Zone 4	Annual Number of Vessels using AMP	Annual Number of Transits with Slide Valves	Transit	Maneuvering	Berth/ Anchorage
Alternative 2 No Federal Action																						
2026	Container1000	Propulsion	15,627	2004	20					0	0.1%					0.1%	0	0	0	0		
	Container1000	Auxiliary	4,421			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	396	942	297
	Container1000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	241	241	241
	Container2000	Propulsion	22,469	2004	22	1	1	10.5	52	104	0.1%	1	1	1		0.1%	99	80	42	33			
	Container2000	Auxiliary	4,649			1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	42	33	981	2,180	1,035
	Container2000	Auxiliary Boiler				1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	42	33	325	325	325
	Container3000	Propulsion	29,107	1999	23	1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	42	33			
	Container3000	Auxiliary	3,919			1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	42	33	602	2,063	516
	Container3000	Auxiliary Boiler				1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	42	33	474	474	474
	Container4000	Propulsion	41,323	2000	24					0	0.1%				0	0.1%	0	0	0	0			
	Container4000	Auxiliary	7,058			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,434	2,523	1,161
	Container4000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	492	492	492
	Container5000	Propulsion	50,247	2002	25					0	0.1%					0.1%	0	0	0	0			
	Container5000	Auxiliary	8,228			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,176	4,200	1,008
	Container5000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	630	630	630
	Container6000	Propulsion	60,580	2006	25					0	0.1%					0.1%	0	0	0	0			
	Container6000	Auxiliary	10,631			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,425	2,178	986
	Container6000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	565	565	565
	Container7000	Propulsion	57,217	2006	25	0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0			
	Container7000	Auxiliary	10,771			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,539	3,434	1,066
	Container7000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	551	551	551
	Container8000	Propulsion	66,868	2006	25	2	2	10.5	102	204	0.1%	1				0.1%	194	157	82	65			
	Container8000	Auxiliary	10,911			2	2	10.5	102	204	0.1%	1	0	0	0	0.1%	194	157	82	65	1,416	3,158	980
	Container8000	Auxiliary Boiler				2	2	10.5	102	204	0.1%	1	0	0	0	0.1%	194	157	82	65	525	525	525
	Container9000	Propulsion	67,428	2007	25	0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0			
	Container9000	Auxiliary	11,520			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,502	3,350	1,040
	Container9000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	547	547	547
	Container10000	Propulsion	68,034	2007	25					0	0.1%		0			0.1%	0	0	0	0			
	Container10000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,751	3,675	1,270
	Container10000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	574	574	574
	Container11000	Propulsion	68,639	2008	25					0	0.1%		0			0.1%	0	0	0	0			
	Container11000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	2,000	4,000	1,500
	Container11000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	600	600	600
	Container12000	Propulsion	67,399	2010	25					0	0.1%					0.1%	0	0	0	0			
	Container12000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	2,500	4,500	2,000
	Container12000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	600	600	600
	Container13000	Propulsion																					
	Container13000	Auxiliary																					
	Container13000	Auxiliary Boiler																					
	Container14000	Propulsion																					
	Container14000	Auxiliary																					
	Container14000	Auxiliary Boiler																					
Total 2026						**4**	**4**		**206**	**412**		**3**	**2**	**2**	**0**		**391**	**317**	**165**	**132**			

Table B1.23 **Operational OGV Emissions Without Mitigation - Proposed Project and Alternatives**

			Vessel Characteristics			Activity															Average Auxiliary Load (kW)		
	Vessel Type	Engine/Source Type	Engine Rating (kW)	Vessel Year	Max Rated Speed (knots)	Peak Day Berth Calls	Peak Day Transits	Peak Day Hotelling Time Per Vessel (hr/day)	Annual Berth Calls	Annual Transits	Peak Day Fuel Sulfur	Peak Day Number of Transits in Compliance with VSRP in Zone 3	Peak Day Number of Transits in Compliance with VSRP in Zone 4	Peak Day Number of Vessels using AMP	Peak Day Number of Transits with Slide Valves	Annual Fuel Sulfur	Annual Number of Transits in Compliance with VSRP in Zone 3	Annual Number of Transits in Compliance with VSRP in Zone 4	Annual Number of Vessels using AMP	Annual Number of Transits with Slide Valves	Transit	Maneuvering	Berth/ Anchorage
Alternative 3 Reduced Project																							
2015	Container1000	Propulsion	15,627	2004	20					0	0.1%					0.1%	0	0	0	0			
	Container1000	Auxiliary	4,421			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	396	942	297
	Container1000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	241	241	241
	Container2000	Propulsion	22,469	2004	22	1	1	10.5	52	104	0.1%	1	1			0.1%	99	80	26	33			
	Container2000	Auxiliary	4,649			1	1	10.5	52	104	0.1%	1	1	0	0	0.1%	99	80	26	33	981	2,180	1,035
	Container2000	Auxiliary Boiler				1	1	10.5	52	104	0.1%	1	1	0	0	0.1%	99	80	26	33	325	325	325
	Container3000	Propulsion	29,107	1999	23	1	1	10.5	52	104	0.1%	1	1	0	0	0.1%	99	80	26	33			
	Container3000	Auxiliary	3,919			1	1	10.5	52	104	0.1%	1	1	0	0	0.1%	99	80	26	33	602	2,063	516
	Container3000	Auxiliary Boiler				1	1	10.5	52	104	0.1%	1	1	0	0	0.1%	99	80	26	33	474	474	474
	Container4000	Propulsion	41,323	2000	24					0	0.1%			0	0	0.1%	0	0	0	0			
	Container4000	Auxiliary	7,058			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,434	2,523	1,161
	Container4000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	492	492	492
	Container5000	Propulsion	50,247	2002	25					0	0.1%					0.1%	0	0	0	0			
	Container5000	Auxiliary	8,228			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,176	4,200	1,008
	Container5000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	630	630	630
	Container6000	Propulsion	60,580	2006	25	1	1	10.5	94	188	0.1%	1				0.1%	179	145	47	60			
	Container6000	Auxiliary	10,631			1	1	10.5	94	188	0.1%	1	0	0	0	0.1%	179	145	47	60	1,425	2,178	986
	Container6000	Auxiliary Boiler				1	1	10.5	94	188	0.1%	1	0	0	0	0.1%	179	145	47	60	565	565	565
	Container7000	Propulsion	57,217	2006	25	1	1	10.5	8	16	0.1%			0	0	0.1%	15	12	4	5			
	Container7000	Auxiliary	10,771			1	1	10.5	8	16	0.1%	0	0	0	0	0.1%	15	12	4	5	1,539	3,434	1,066
	Container7000	Auxiliary Boiler				1	1	10.5	8	16	0.1%	0	0	0	0	0.1%	15	12	4	5	551	551	551
	Container8000	Propulsion	66,868	2006	25					0	0.1%					0.1%	0	0	0	0			
	Container8000	Auxiliary	10,911			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,416	3,158	980
	Container8000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	525	525	525
	Container9000	Propulsion	67,428	2007	25	0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0			
	Container9000	Auxiliary	11,520			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,502	3,350	1,040
	Container9000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	547	547	547
	Container10000	Propulsion	68,034	2007	25					0	0.1%					0.1%	0	0	0	0			
	Container10000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,751	3,675	1,270
	Container10000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	574	574	574
	Container11000	Propulsion	68,639	2008	25					0	0.1%					0.1%	0	0	0	0			
	Container11000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	2,000	4,000	1,500
	Container11000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	600	600	600
	Container12000	Propulsion	67,399	2010	25					0	0.1%					0.1%	0	0	0	0			
	Container12000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	2,500	4,500	2,000
	Container12000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	600	600	600
	Container13000	Propulsion																					
	Container13000	Auxiliary																					
	Container13000	Auxiliary Boiler																					
	Container14000	Propulsion																					
	Container14000	Auxiliary																					
	Container14000	Auxiliary Boiler																					
Total 2015						**4**	**4**		**206**	**412**		**3**	**2**	**0**	**0**		**391**	**317**	**103**	**132**			

Table B1.23 **Operational OGV Emissions Without Mitigation - Proposed Project and Alternatives**

			Vessel Characteristics			Activity															Average Auxiliary Load (kW)		
	Vessel Type	Engine/Source Type	Engine Rating (kW)	Vessel Year	Max Rated Speed (knots)	Peak Day Berth Calls	Peak Day Transits	Peak Day Hotelling Time Per Vessel (hr/day)	Annual Berth Calls	Annual Transits	Peak Day Fuel Sulfur	Peak Day Number of Transits in Compliance with VSRP in Zone 3	Peak Day Number of Transits in Compliance with VSRP in Zone 4	Peak Day Number of Vessels using AMP	Peak Day Number of Transits with Slide Valves	Annual Fuel Sulfur	Annual Number of Transits in Compliance with VSRP in Zone 3	Annual Number of Transits in Compliance with VSRP in Zone 4	Annual Number of Vessels using AMP	Annual Number of Transits with Slide Valves	Transit	Maneuvering	Berth/ Anchorage
Alternative 3 Reduced Project																							
2016	Container1000	Propulsion	15,627	2004	20					0	0.1%					0.1%	0	0	0	0			
	Container1000	Auxiliary	4,421			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	396	942	297
	Container1000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	241	241	241
	Container2000	Propulsion	22,469	2004	22	1	1	10.5	52	104	0.1%	1	1			0.1%	99	80	26	33			
	Container2000	Auxiliary	4,649			1	1	10.5	52	104	0.1%	1	1	0	0	0.1%	99	80	26	33	981	2,180	1,035
	Container2000	Auxiliary Boiler				1	1	10.5	52	104	0.1%	1	1	0	0	0.1%	99	80	26	33	325	325	325
	Container3000	Propulsion	29,107	1999	23	1	1	10.5	52	104	0.1%	1	1	0	0	0.1%	99	80	26	33			
	Container3000	Auxiliary	3,919			1	1	10.5	52	104	0.1%	1	1	0	0	0.1%	99	80	26	33	602	2,063	516
	Container3000	Auxiliary Boiler				1	1	10.5	52	104	0.1%	1	1	0	0	0.1%	99	80	26	33	474	474	474
	Container4000	Propulsion	41,323	2000	24					0	0.1%			0	0	0.1%	0	0	0	0			
	Container4000	Auxiliary	7,058			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,434	2,523	1,161
	Container4000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	492	492	492
	Container5000	Propulsion	50,247	2002	25					0	0.1%					0.1%	0	0	0	0			
	Container5000	Auxiliary	8,228			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,176	4,200	1,008
	Container5000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	630	630	630
	Container6000	Propulsion	60,580	2006	25	1	1	10.5	94	188	0.1%	1				0.1%	179	145	47	60			
	Container6000	Auxiliary	10,631			1	1	10.5	94	188	0.1%	1	0	0	0	0.1%	179	145	47	60	1,425	2,178	986
	Container6000	Auxiliary Boiler				1	1	10.5	94	188	0.1%	1	0	0	0	0.1%	179	145	47	60	565	565	565
	Container7000	Propulsion	57,217	2006	25	1	1	10.5	8	16	0.1%			0	0	0.1%	15	12	4	5			
	Container7000	Auxiliary	10,771			1	1	10.5	8	16	0.1%	0	0	0	0	0.1%	15	12	4	5	1,539	3,434	1,066
	Container7000	Auxiliary Boiler				1	1	10.5	8	16	0.1%	0	0	0	0	0.1%	15	12	4	5	551	551	551
	Container8000	Propulsion	66,868	2006	25					0	0.1%					0.1%	0	0	0	0			
	Container8000	Auxiliary	10,911			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,416	3,158	980
	Container8000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	525	525	525
	Container9000	Propulsion	67,428	2007	25	0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0			
	Container9000	Auxiliary	11,520			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,502	3,350	1,040
	Container9000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	547	547	547
	Container10000	Propulsion	68,034	2007	25					0	0.1%					0.1%	0	0	0	0			
	Container10000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,751	3,675	1,270
	Container10000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	574	574	574
	Container11000	Propulsion	68,639	2008	25					0	0.1%					0.1%	0	0	0	0			
	Container11000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	2,000	4,000	1,500
	Container11000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	600	600	600
	Container12000	Propulsion	67,399	2010	25					0	0.1%					0.1%	0	0	0	0			
	Container12000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	2,500	4,500	2,000
	Container12000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	600	600	600
	Container13000	Propulsion																					
	Container13000	Auxiliary																					
	Container13000	Auxiliary Boiler																					
	Container14000	Propulsion																					
	Container14000	Auxiliary																					
	Container14000	Auxiliary Boiler																					
Total 2016						**4**	**4**		**206**	**412**		**3**	**2**	**0**	**0**		**391**	**317**	**103**	**132**			

Table B1.23 **Operational OGV Emissions Without Mitigation - Proposed Project and Alternatives**

			Vessel Characteristics			Activity															Average Auxiliary Load (kW)		
	Vessel Type	Engine/Source Type	Engine Rating (kW)	Vessel Year	Max Rated Speed (knots)	Peak Day Berth Calls	Peak Day Transits	Peak Day Hotelling Time Per Vessel (hr/day)	Annual Berth Calls	Annual Transits	Peak Day Fuel Sulfur	Peak Day Number of Transits in Compliance with VSRP in Zone 3	Peak Day Number of Transits in Compliance with VSRP in Zone 4	Peak Day Number of Vessels using AMP	Peak Day Number of Transits with Slide Valves	Annual Fuel Sulfur	Annual Number of Transits in Compliance with VSRP in Zone 3	Annual Number of Transits in Compliance with VSRP in Zone 4	Annual Number of Vessels using AMP	Annual Number of Transits with Slide Valves	Transit	Maneuvering	Berth/ Anchorage
Alternative 3 Reduced Project																							
2017	Container1000	Propulsion	15,627	2004	20					0	0.1%					0.1%	0	0	0	0			
	Container1000	Auxiliary	4,421			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	396	942	297
	Container1000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	241	241	241
	Container2000	Propulsion	22,469	2004	22	1	1	10.5	52	104	0.1%	1	1	1		0.1%	99	80	36	33			
	Container2000	Auxiliary	4,649			1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	36	33	981	2,180	1,035
	Container2000	Auxiliary Boiler				1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	36	33	325	325	325
	Container3000	Propulsion	29,107	1999	23	1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	36	33			
	Container3000	Auxiliary	3,919			1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	36	33	602	2,063	516
	Container3000	Auxiliary Boiler				1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	36	33	474	474	474
	Container4000	Propulsion	41,323	2000	24					0	0.1%			0	0	0.1%	0	0	0	0			
	Container4000	Auxiliary	7,058			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,434	2,523	1,161
	Container4000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	492	492	492
	Container5000	Propulsion	50,247	2002	25					0	0.1%					0.1%	0	0	0	0			
	Container5000	Auxiliary	8,228			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,176	4,200	1,008
	Container5000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	630	630	630
	Container6000	Propulsion	60,580	2006	25	1	1	19.0	52	104	0.1%	1				0.1%	99	80	36	33			
	Container6000	Auxiliary	10,631			1	1	19.0	52	104	0.1%	1	0	0	0	0.1%	99	80	36	33	1,425	2,178	986
	Container6000	Auxiliary Boiler				1	1	19.0	52	104	0.1%	1	0	0	0	0.1%	99	80	36	33	565	565	565
	Container7000	Propulsion	57,217	2006	25					0	0.1%		0	0	0	0.1%	0	0	0	0			
	Container7000	Auxiliary	10,771			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,539	3,434	1,066
	Container7000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	551	551	551
	Container8000	Propulsion	66,868	2006	25	0	0	0.0	0	0	0.1%					0.1%	0	0	0	0			
	Container8000	Auxiliary	10,911			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,416	3,158	980
	Container8000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	525	525	525
	Container9000	Propulsion	67,428	2007	25	0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0			
	Container9000	Auxiliary	11,520			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,502	3,350	1,040
	Container9000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	547	547	547
	Container10000	Propulsion	68,034	2007	25	1	1	19.0	50	100	0.1%					0.1%	95	77	35	32			
	Container10000	Auxiliary	na			1	1	19.0	50	100	0.1%	0	0	0	0	0.1%	95	77	35	32	1,751	3,675	1,270
	Container10000	Auxiliary Boiler				1	1	19.0	50	100	0.1%	0	0	0	0	0.1%	95	77	35	32	574	574	574
	Container11000	Propulsion	68,639	2008	25					0	0.1%					0.1%	0	0	0	0			
	Container11000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	2,000	4,000	1,500
	Container11000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	600	600	600
	Container12000	Propulsion	67,399	2010	25					0	0.1%					0.1%	0	0	0	0			
	Container12000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	2,500	4,500	2,000
	Container12000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	600	600	600
	Container13000	Propulsion																					
	Container13000	Auxiliary																					
	Container13000	Auxiliary Boiler																					
	Container14000	Propulsion																					
	Container14000	Auxiliary																					
	Container14000	Auxiliary Boiler																					
Total 2017						**4**	**4**		**206**	**412**		**3**	**2**	**2**	**0**		**391**	**317**	**144**	**132**			

Table B1.23 **Operational OGV Emissions Without Mitigation - Proposed Project and Alternatives**

			Vessel Characteristics			Activity														Average Auxiliary Load (kW)		
	Vessel Type	Engine/Source Type	Engine Rating (kW)	Vessel Year	Max Rated Speed (knots)	Peak Day Berth Calls	Peak Day Transits	Peak Day Hotelling Time Per Vessel (hr/day)	Annual Berth Calls	Annual Transits	Peak Day Fuel Sulfur	Peak Day Number of Transits in Compliance with VSRP in Zone 3	Peak Day Number of Transits in Compliance with VSRP in Zone 4	Peak Day Number of Vessels using AMP	Peak Day Number of Transits with Slide Valves	Annual Fuel Sulfur	Annual Number of Transits in Compliance with VSRP in Zone 3	Annual Number of Transits in Compliance with VSRP in Zone 4	Annual Number of Vessels using AMP	Annual Number of Transits with Slide Valves	Transit	Maneuvering	Berth/ Anchorage
Alternative 3 Reduced Project																						
2020	Container1000	Propulsion	15,627	2004	20					0	0.1%					0.1%	0	0	0	0		
	Container1000	Auxiliary	4,421			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	396	942	297
	Container1000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	241	241	241
	Container2000	Propulsion	22,469	2004	22	1	1	10.5	52	104	0.1%	1	1	1		0.1%	99	80	42	33			
	Container2000	Auxiliary	4,649			1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	42	33	981	2,180	1,035
	Container2000	Auxiliary Boiler				1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	42	33	325	325	325
	Container3000	Propulsion	29,107	1999	23	1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	42	33			
	Container3000	Auxiliary	3,919			1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	42	33	602	2,063	516
	Container3000	Auxiliary Boiler				1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	42	33	474	474	474
	Container4000	Propulsion	41,323	2000	24					0	0.1%				0	0.1%	0	0	0	0			
	Container4000	Auxiliary	7,058			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,434	2,523	1,161
	Container4000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	492	492	492
	Container5000	Propulsion	50,247	2002	25					0	0.1%					0.1%	0	0	0	0			
	Container5000	Auxiliary	8,228			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,176	4,200	1,008
	Container5000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	630	630	630
	Container6000	Propulsion	60,580	2006	25	1	1	19.0	26	52	0.1%	1		1		0.1%	49	40	21	17			
	Container6000	Auxiliary	10,631			1	1	19.0	26	52	0.1%	1	0	1	0	0.1%	49	40	21	17	1,425	2,178	986
	Container6000	Auxiliary Boiler				1	1	19.0	26	52	0.1%	1	0	1	0	0.1%	49	40	21	17	565	565	565
	Container7000	Propulsion	57,217	2006	25		0			0	0.1%		0		0	0.1%	0	0	0	0			
	Container7000	Auxiliary	10,771			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,539	3,434	1,066
	Container7000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	551	551	551
	Container8000	Propulsion	66,868	2006	25	1	1	10.5	52	104	0.1%	1				0.1%	99	80	42	33			
	Container8000	Auxiliary	10,911			1	1	10.5	52	104	0.1%	1	0	0	0	0.1%	99	80	42	33	1,416	3,158	980
	Container8000	Auxiliary Boiler				1	1	10.5	52	104	0.1%	1	0	0	0	0.1%	99	80	42	33	525	525	525
	Container9000	Propulsion	67,428	2007	25	0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0			
	Container9000	Auxiliary	11,520			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,502	3,350	1,040
	Container9000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	547	547	547
	Container10000	Propulsion	68,034	2007	25	1	1	10.5	50	100	0.1%		0			0.1%	95	77	40	32			
	Container10000	Auxiliary	na			1	1	10.5	50	100	0.1%	0	0	0	0	0.1%	95	77	40	32	1,751	3,675	1,270
	Container10000	Auxiliary Boiler				1	1	10.5	50	100	0.1%	0	0	0	0	0.1%	95	77	40	32	574	574	574
	Container11000	Propulsion	68,639	2008	25					0	0.1%					0.1%	0	0	0	0			
	Container11000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	2,000	4,000	1,500
	Container11000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	600	600	600
	Container12000	Propulsion	67,399	2010	25					0	0.1%					0.1%	0	0	0	0			
	Container12000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	2,500	4,500	2,000
	Container12000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	600	600	600
	Container13000	Propulsion																					
	Container13000	Auxiliary																					
	Container13000	Auxiliary Boiler																					
	Container14000	Propulsion																					
	Container14000	Auxiliary																					
	Container14000	Auxiliary Boiler																					
Total 2020						**5**	**5**		**232**	**464**		**4**	**2**	**3**	**0**		**441**	**357**	**186**	**148**			

Table B1.23 **Operational OGV Emissions Without Mitigation - Proposed Project and Alternatives**

			Vessel Characteristics			Activity															Average Auxiliary Load (kW)		
	Vessel Type	Engine/Source Type	Engine Rating (kW)	Vessel Year	Max Rated Speed (knots)	Peak Day Berth Calls	Peak Day Transits	Peak Day Hotelling Time Per Vessel (hr/day)	Annual Berth Calls	Annual Transits	Peak Day Fuel Sulfur	Peak Day Number of Transits in Compliance with VSRP in Zone 3	Peak Day Number of Transits in Compliance with VSRP in Zone 4	Peak Day Number of Vessels using AMP	Peak Day Number of Transits with Slide Valves	Annual Fuel Sulfur	Annual Number of Transits in Compliance with VSRP in Zone 3	Annual Number of Transits in Compliance with VSRP in Zone 4	Annual Number of Vessels using AMP	Annual Number of Transits with Slide Valves	Transit	Maneuvering	Berth/ Anchorage
Alternative 3 Reduced Project																							
2026	Container1000	Propulsion	15,627	2004	20					0	0.1%					0.1%	0	0	0	0			
	Container1000	Auxiliary	4,421			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	396	942	297
	Container1000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	241	241	241
	Container2000	Propulsion	22,469	2004	22	1	1	10.5	52	104	0.1%	1	1	1		0.1%	99	80	42	33			
	Container2000	Auxiliary	4,649			1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	42	33	981	2,180	1,035
	Container2000	Auxiliary Boiler				1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	42	33	325	325	325
	Container3000	Propulsion	29,107	1999	23	1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	42	33			
	Container3000	Auxiliary	3,919			1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	42	33	602	2,063	516
	Container3000	Auxiliary Boiler				1	1	10.5	52	104	0.1%	1	1	1	0	0.1%	99	80	42	33	474	474	474
	Container4000	Propulsion	41,323	2000	24					0	0.1%				0	0.1%	0	0	0	0			
	Container4000	Auxiliary	7,058			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,434	2,523	1,161
	Container4000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	492	492	492
	Container5000	Propulsion	50,247	2002	25					0	0.1%					0.1%	0	0	0	0			
	Container5000	Auxiliary	8,228			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,176	4,200	1,008
	Container5000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	630	630	630
	Container6000	Propulsion	60,580	2006	25	1	1	19.0	26	52	0.1%	1		1		0.1%	49	40	21	17			
	Container6000	Auxiliary	10,631			1	1	19.0	26	52	0.1%	1	0	1	0	0.1%	49	40	21	17	1,425	2,178	986
	Container6000	Auxiliary Boiler				1	1	19.0	26	52	0.1%	1	0	1	0	0.1%	49	40	21	17	565	565	565
	Container7000	Propulsion	57,217	2006	25		0			0	0.1%	0	0		0	0.1%	0	0	0	0			
	Container7000	Auxiliary	10,771			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,539	3,434	1,066
	Container7000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	551	551	551
	Container8000	Propulsion	66,868	2006	25	0	0	0.0	0	0	0.1%					0.1%	0	0	0	0			
	Container8000	Auxiliary	10,911			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,416	3,158	980
	Container8000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	525	525	525
	Container9000	Propulsion	67,428	2007	25	0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0			
	Container9000	Auxiliary	11,520			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	1,502	3,350	1,040
	Container9000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	547	547	547
	Container10000	Propulsion	68,034	2007	25	2	2	10.5	102	204	0.1%	1	0			0.1%	194	157	82	65			
	Container10000	Auxiliary	na			2	2	10.5	102	204	0.1%	1	0	0	0	0.1%	194	157	82	65	1,751	3,675	1,270
	Container10000	Auxiliary Boiler				2	2	10.5	102	204	0.1%	1	0	0	0	0.1%	194	157	82	65	574	574	574
	Container11000	Propulsion	68,639	2008	25					0	0.1%		0			0.1%	0	0	0	0			
	Container11000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	2,000	4,000	1,500
	Container11000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	600	600	600
	Container12000	Propulsion	67,399	2010	25					0	0.1%					0.1%	0	0	0	0			
	Container12000	Auxiliary	na			0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	2,500	4,500	2,000
	Container12000	Auxiliary Boiler				0	0	0.0	0	0	0.1%	0	0	0	0	0.1%	0	0	0	0	600	600	600
	Container13000	Propulsion																					
	Container13000	Auxiliary																					
	Container13000	Auxiliary Boiler																					
	Container14000	Propulsion																					
	Container14000	Auxiliary																					
	Container14000	Auxiliary Boiler																					
Total 2026						**5**	**5**		**232**	**464**		**4**	**2**	**3**	**0**		**441**	**357**	**186**	**148**			

Table B1.24 **OGV Control Factors**

	PM10	PM2.5	DPM	NOx	SOx	CO	HC	VOC	CO2	CH4	N2O	Connect/Disconnect Time(hr)
2012												
AMP Control Factor	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	3
Fuel Slide Valve Control Factor	25%	25%	25%	30%								

Source: 2011 POLA Emissions Inventory.

Source: CARB OGV Shore Power Regulation.

Table B1.25 **OGV Control Compliance**

	Unmitigated					Mitigated	
	Sulfur Content	VSRP Zone 3 (PZ to 20nm)	VSRP Zone 4 (20nm-40nm)	AMP	Slide Valves	VSRP Zone 4 (20nm-40nm)	AMP
2012	0.50%	100%	77%	actual inventory	actual inventory	not applicable to baseline	not applicable to baseline
2015	0.10%	95%	77%	50%	32%	77%	50%
2016	0.10%	95%	77%	50%	32%	77%	50%
2017	0.10%	95%	77%	70%	32%	95%	70%
2020	0.10%	95%	77%	80%	32%	95%	80%
2026	0.10%	95%	77%	80%	32%	95%	91%

Source:

1. Sulfur Content: CARB's Low Sulfur Fuel for Marine Auxiliary Engines, Main Engines, and Auxiliary Boilers.
2. Assumed that all vessels followed CARB's Fuel Switch Regulation within CARB's 2012+ in-state boundary and used distillate fuel with average sulfur content of 0.5% in 2012 and 0.1% after 1/1/2014. All ship routes and analyzed zones fall within CARB's 2012+ in-state boundary.
3. VSRP compliance: during baseline (Starcrest 2013); during future years (LAHD 2011 APL EIS/EIR)

4. Unmitigated AMP: CARB's Regulation to Reduce Emissions from Diesel Auxiliary Engines on OGVs While at Berth in California Ports
5. Slide valves: assumed 32% of all vessel calls (POLA 2011 Inventory).
6. AMP mitigation is applied in 2026. In 2026, NYK vessels will meet 95% AMP and non-NYK vessels will meet the regulatory requirement of 80%. Given that NYK vessels in 2026 are projected to be 56% of total, the composite mitigation is: 80% + [(100%-80%) * 56% * 95%] = 90.6%.

Table B1.26 **2012 OGV Average Hotelling Times/Load** **Future Years**

Category	Engine Type	Avg Hotelling Time (hrs) Anchorage	Avg Hotelling Time (hrs) At Berth		Avg Hotelling Time (hrs) At Berth	At Anchorage
Container1000	Auxiliary	88	20		50	16.8
Container1000	Auxiliary Boiler	88	20		50	
Container2000	Auxiliary	32	25		50	30.7
Container2000	Auxiliary Boiler	32	25		50	
Container4000	Auxiliary	0	11		50	7.4
Container4000	Auxiliary Boiler	0	11		50	
Container5000	Auxiliary	2	76		50	3.8
Container5000	Auxiliary Boiler	2	76		50	
Container6000	Auxiliary	54	82		50	6.8
Container6000	Auxiliary Boiler	54	82		50	
Container7000	Auxiliary	0	80		50	0
Container7000	Auxiliary Boiler	0	80		50	
Reefer	Auxiliary	4	8		50	
Reefer	Auxiliary Boiler	4	47		50	
				average:	50	13.1

Source:
Starcrest provided 2012 YTI data.
Future years:

Average time at berth: POLA, AECom berth and yard capacity calculations. Hotelling time will not increase in future years because increased throughput is handled with more cranes.
Average time at anchorage: 2012 POLA Inventory, Table 3.28 Average Hotelling Times at Anchorage by Vessel Type.

Table B1.27 **Vessel Speed Parameters**

	Arrivals		Future Years	
Category	Avg Transit PZ-20 Speed (knots)	Avg Transit 20-40 Speed (knots)	Average Transit PZ-20 Speed (knots)	Average Transit 20-40 Speed (knots)
Container1000	9.4	10.4		
Container2000	9.1	10.7		
Container4000	8.0	12.3		
Container5000	9.8	10.5	9.6	11.3
Container6000	10.7	12.6		
Container7000	9.3	9.4		
Reefer	11.0	13.5		
	Departures			
Category	**Avg Transit PZ-20 Speed (knots)**	**Avg Transit 20-40 Speed (knots)**		
Container1000	11.2	12.0		
Container2000	10.4	10.8		
Container4000	9.7	16.8		
Container5000	10.8	11.3	10.7	13.4
Container6000	11.1	14.9		
Container7000	10.3	12.3		
Reefer	11.4	15.8		
Crane delivery ship		maximum rated	9.0	
Manuvering Time (Average of all arrivals and departures)				
1.10	hours			

Source:
Speed information provided by Starcrest for container ships and reefers.

Table B1.28 **Maximum Rated Vessel Speed**

Category	Speed (knots)
Container1000	19.9
Container2000	21.6
Container3000	22.5
Container4000	23.9
Container5000	25.1
Container6000	25.1
Container7000	25.3
Container8000	25.0
Container9000	25.1
All Other Vessel Categories	25.1
Reefer	19.3
Crane delivery ship	9.0

Source:
Maximum rated speed information obtained from 2011 POLA Inventory, Table 3.26, Vessel Type Characteristics. Crane delivery ship treated as a general cargo ship.

Table B1.29 **Transit Distances (nm)**

			Zone 1: Harbor	Zone 2: Breakwater to PZ		Zone 3: PZ to 20nm		Zone 4: 20nm to 40nm		Zone 5: 40 nm to 50nm SCAB overwater boundary	Zone 6: 50nm to 170nm State Over-Water Boundary
% Calls By Route	**Arrival**	**Departure**		Arrival	Departure	Arrival	Departure	Arrival	Departure		
East	0%	0%	3.7	7.63	7.63	25.75	25.75	0	0		
North	46%	38%	3.7	8.57	7.63	21.91	21.68	21.37	20.75		
South	36%	34%	3.7	8.47	7.36	11.11	12.55	20.18	19.92		
West	18%	28%	3.7	8.58	8.58	18.97	18.97	21.12	21.12		
	100%	100%									
Average Distance			3.7	8.17		17.65		20.73		10	120

Source:
Starcrest

Table B1.30 **Emission Factors for OGV Propulsion Power using Residual Oil, g/kW-hr**

Engine	Model Year	PM10	PM2.5	DPM	NOx	SOx	CO	HC	VOC	CO2	CH4	N2O
Slow Speed Diesel [1]	≤1999	1.5	1.2	1.5	18.1	10.5	1.4	0.6	0.63	620	0.012	0.031
Medium Speed Diesel [2]	≤1999	1.5	1.2	1.5	14.0	11.5	1.1	0.5	0.53	683	0.010	0.031
Slow Speed Diesel	**2000-2010[3]**	**1.5**	**1.2**	**1.5**	**17.0**	**10.5**	**1.4**	**0.6**	**0.63**	**620**	**0.012**	**0.031**
Medium Speed Diesel [2]	2000-2010	1.5	1.2	1.5	13.0	11.5	1.1	0.5	0.53	683	0.010	0.031
Slow Speed Diesel	2011-2015	1.5	1.2	1.5	15.3	10.5	1.4	0.6	0.63	620	0.012	0.031
Medium Speed Diesel [2]	2011-2015	1.5	1.2	1.5	11.2	11.5	1.1	0.5	0.53	683	0.010	0.031
Gas Turbine	all	0.05	0.04	0	6.1	16.5	0.2	0.1	0.11	970	0.002	0.08
Steam Ship	all	0.8	0.64	0	2.1	16.5	0.2	0.1	0.11	970	0.002	0.08
Slow Speed Diesel in ECA	2016+	1.5	1.2	1.5	3.4	10.5	1.4	0.6	0.63	620	0.012	0.031
Medium Speed Diesel [2] in ECA	2016+	1.5	1.2	1.5	3.1	11.5	1.1	0.5	0.53	683	0.010	0.031

Notes:

1. Slow speed diesel: engine speed < 150 rpm; assumed as default for propulsion engines

2. Medium speed diesel: engine speed > 150 rpm (500 rpm typical). Per MARPOL Annex VI: NOx emission factor for Tier I = 45^{n}-0.2; Tier II = 44^{n}-0.23, Tier III = 9^{n}-0.2.

Fuel sulfur content: 2.7%

3. MARPOL Annex VI NOx emission limits (bold type) applied 100%. SOx is represented for 2.7% sulfur fuel content and is adjusted in calculations.

Tier 3 standards are required for vessels built on or after January 1, 2016 and that operate in an ECA. At the 65th session (May 2013), MEPC agreed to consider a draft amendment to postpone the date for the implementation of Tier 3 NOx standards applicable within ECAs from 2016 to 2021. The draft amendments will be considered for adoption during 66th session of MEPC in March 2014.

Calculations do not take credit for Tier 3 vessels because it cannot be guaranteed what portion of vessels calling at the YTI terminal will be Tier 3 and in which year.

Source: POLA 2012 Emissions Inventory, Tables 3.5 and 3.6; IMO requirements for ECAs.

Table B1.31 **Low Load Adjustment Factors - Propulsion Engines**

Load	PM10	PM2.5	DPM	NOx	SOx	CO	HC	VOC	CO2	CH4	N2O
2% docking load	7.29	7.29	7.29	4.63	1.00	9.70	21.18	21.18	1.00	21.18	4.63
3% transit load	4.33	4.33	4.33	2.92	1.00	6.49	11.68	11.68	1.00	11.68	2.92
4% transit load	3.09	3.09	3.09	2.21	1.00	4.86	7.71	7.71	1.00	7.71	2.21
5% transit load	2.44	2.44	2.44	1.83	1.00	3.90	5.61	5.61	1.00	5.61	1.83
6% transit load	2.04	2.04	2.04	1.60	1.00	3.26	4.35	4.35	1.00	4.35	1.60
7% transit load	1.79	1.79	1.79	1.45	1.00	2.80	3.52	3.52	1.00	3.52	1.45
8% transit load	1.61	1.61	1.61	1.35	1.00	2.45	2.95	2.95	1.00	2.95	1.35
9% transit load	1.48	1.48	1.48	1.27	1.00	2.18	2.52	2.52	1.00	2.52	1.27
10% transit load	1.38	1.38	1.38	1.22	1.00	1.97	2.18	2.18	1.00	2.18	1.22
11% transit load	1.30	1.30	1.30	1.17	1.00	1.79	1.96	1.96	1.00	1.96	1.17
12% transit load	1.24	1.24	1.24	1.14	1.00	1.64	1.76	1.76	1.00	1.76	1.14
13% transit load	1.19	1.19	1.19	1.11	1.00	1.52	1.60	1.60	1.00	1.60	1.11
14% transit load	1.15	1.15	1.15	1.08	1.00	1.41	1.47	1.47	1.00	1.47	1.08
15% transit load	1.11	1.11	1.11	1.06	1.00	1.32	1.36	1.36	1.00	1.36	1.06
16% transit load	1.08	1.08	1.08	1.05	1.00	1.24	1.26	1.26	1.00	1.26	1.05
17% transit load	1.06	1.06	1.06	1.03	1.00	1.17	1.18	1.18	1.00	1.18	1.03
18% transit load	1.04	1.04	1.04	1.02	1.00	1.11	1.11	1.11	1.00	1.11	1.02
19% transit load	1.02	1.02	1.02	1.01	1.00	1.05	1.05	1.05	1.00	1.05	1.01
20% transit load	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Source: POLA 2012 Emissions Inventory, Table 3.9.

Table B1.32 **AMP Electricity Consumption Emission Factors (lb/MW-hr)**

	PM10	PM2.5	DPM	NOx	SOx	CO	HC	VOC	CO2	CH4	N2O
	0.04	0.04	0.04	0.4192	0.1822	0.2		0.01	658.68	0.02894	0.00617

Source:
CO, VOC, and PM criteria pollutant emission factors are from SCAQMD 1993 CEQA Handbook, Table A9-11-B.
NOx and SOx emission factors are from eGrid 2012, Version 1.0, Year 2009 Summary Tables.
GHG emission factors are from The Climate Registry, 2013 Default Emission Factors, Table 14.1 (US Emission Factors by eGrid Subregion CAMX.

Table B1.33 **Reefer OGV Refrigerant Loss**

	Charge (mton)	Annual Loss (%)	Refrigerant Type
Reefer OGV	3	20%	HCFC-22

Fugitive CO2e emissions determined by: Charge (mton) * Annual Loss (%) *
Time Spent in Study Area (yr) * GWP

Source: UN Environmental Programme 2006 and 2010 Report of the
Refrigeration, Air Conditioning and Heat Pumps Technical Options
Committee. Available online: http://ozone.unep.org/teap/Reports/RTOC/.
Last accessed April 2013.

Table B1.34 **Emission Factors for OGV Auxiliary Power using Residual Oil, g/kW-hr**

Model Year	PM10	PM2.5	DPM	NOx	SOx	CO	HC	VOC	CO2	CH4	N2O
≤1999	1.5	1.2	1.5	14.7	12.3	1.1	0.4	0.42	683	0.08	0.031
2000-2010	1.5	1.2	1.5	13.0	12.3	1.1	0.4	0.42	683	0.08	0.031
2011-2015	1.5	1.2	1.5	11.2	12.3	1.1	0.4	0.42	683	0.08	0.031
2016+	1.5	1.2	1.5	3.1	12.3	1.1	0.4	0.42	683	0.08	0.031

Source: POLA 2012 Emissions Inventory, Tables 3.10 and 3.11; IMO requirements for ECAs.

Table B1.35 **Emission Factors for OGV Auxiliary Boilers using Residual Oil, g/kW-hr**

Engine	PM10	PM2.5	DPM	NOx	SOx	CO	HC	VOC	CO2	CH4	N2O
Steam Boiler	0.8	0.64	0	2.1	16.5	0.2	0.1	0.11	970	0.002	0.08

Source: POLA 2012 Emissions Inventory, Tables 3.14 and 3.15.

Table B1.36 **Fuel Correction Factors**

Fuel	Sulfur Content	PM10	PM2.5	DPM	NOx	SOx	CO	HC	VOC	CO2	CH4	N2O
HFO	1.5%	0.82	0.82	0.82	1.00	0.555	1.00	1.00	1.00	1.00	1.00	1.00
MDO	1.5%	0.47	0.47	0.47	0.90	0.555	1.00	1.00	1.00	1.00	1.00	0.90
MGO	0.5%	0.25	0.25	0.25	0.94	0.185	1.00	1.00	1.00	0.95	1.00	0.94
MGO	0.41%	0.23	0.23	0.23	0.94	0.152	1.00	1.00	1.00	0.95	1.00	0.94
MGO	0.4%	0.23	0.23	0.23	0.94	0.148	1.00	1.00	1.00	0.95	1.00	0.94
MGO	0.3%	0.21	0.21	0.21	0.94	0.111	1.00	1.00	1.00	0.95	1.00	0.94
MGO	0.2%	0.19	0.19	0.19	0.94	0.074	1.00	1.00	1.00	0.95	1.00	0.94
MGO	0.1%	0.17	0.17	0.17	0.94	0.037	1.00	1.00	1.00	0.95	1.00	0.94

Source: POLA 2012 Emissions Inventory, Table 3.17.

Table B1.37 Harbor Craft Data, Operations

			HC Characteristics							OGV Activity				HC Energy Demand			
Year	HC Classification	Engine Typ	Engine Count per HC	HC Average MY	HC Average HP	HC Average kW	Load Factor	HC Activity per HC (hr/trip)	HC Count per OGV	Peak Day OGV Transit (one-way trips/day)	Average Day OGV Transits (one-way trips/day)	Average Annual OGV Transits (one-way trips/yr)	Peak Day HC Energy Demand (kW-hr/day)	Average Day HC Energy Demand (kW-hr/day)	Annual HC Energy Demand (kW-hr/yr)	Engine Tier
NOP CEQA Baseline																
	Assist Tugboat	Propulsion	2	2004	2,046	1,526	0.31	2.9	2	3	0.9	324	8,119	2,402	876,882	Tier 1
		Auxiliary	2	2007	185	138	0.43	2.9	2	3	0.9	324	1,018	301	109,980	Tier 2
Proposed Project																
2015	Assist Tugboat	Propulsion	2	2004	2,046	1,526	0.31	2.9	2	4	1.1	412	10,826	3,055	1,115,048	Tier 1
		Auxiliary	2	2007	185	138	0.43	2.9	2	4	1.1	412	1,358	383	139,851	Tier 2
2016	Assist Tugboat	Propulsion	2	2004	2,046	1,526	0.31	2.9	2	4	1.1	412	10,826	3,055	1,115,048	Tier 1
		Auxiliary	2	2007	185	138	0.43	2.9	2	4	1.1	412	1,358	383	139,851	Tier 2
2017	Assist Tugboat	Propulsion	2	2004	2,046	1,526	0.31	2.9	2	4	1.1	412	10,826	3,055	1,115,048	Tier 1
		Auxiliary	2	2007	185	138	0.43	2.9	2	4	1.1	412	1,358	383	139,851	Tier 2
2020	Assist Tugboat	Propulsion	2	2017	2,046	1,526	0.31	2.9	2	4	1.1	412	10,826	3,055	1,115,048	Tier 4
		Auxiliary	2	2007	185	138	0.43	2.9	2	4	1.1	412	1,358	383	139,851	Tier 2
2026	Assist Tugboat	Propulsion	2	2017	2,046	1,526	0.31	2.9	2	4	1.1	412	10,826	3,055	1,115,048	Tier 4
		Auxiliary	2	2020	185	138	0.43	2.9	2	4	1.1	412	1,358	383	139,851	Tier 3
Alternative 1 No Project																
2015	Assist Tugboat	Propulsion	2	2004	2,046	1,526	0.31	2.9	2	4	1.1	412	10,826	3,055	1,115,048	Tier 1
		Auxiliary	2	2007	185	138	0.43	2.9	2	4	1.1	412	1,358	383	139,851	Tier 2
2016	Assist Tugboat	Propulsion	2	2004	2,046	1,526	0.31	2.9	2	4	1.1	412	10,826	3,055	1,115,048	Tier 1
		Auxiliary	2	2007	185	138	0.43	2.9	2	4	1.1	412	1,358	383	139,851	Tier 2
2017	Assist Tugboat	Propulsion	2	2004	2,046	1,526	0.31	2.9	2	4	1.1	412	10,826	3,055	1,115,048	Tier 1
		Auxiliary	2	2007	185	138	0.43	2.9	2	4	1.1	412	1,358	383	139,851	Tier 2
2020	Assist Tugboat	Propulsion	2	2017	2,046	1,526	0.31	2.9	2	4	1.1	412	10,826	3,055	1,115,048	Tier 4
		Auxiliary	2	2007	185	138	0.43	2.9	2	4	1.1	412	1,358	383	139,851	Tier 2
2026	Assist Tugboat	Propulsion	2	2017	2,046	1,526	0.31	2.9	2	4	1.1	412	10,826	3,055	1,115,048	Tier 4
		Auxiliary	2	2020	185	138	0.43	2.9	2	4	1.1	412	1,358	383	139,851	Tier 3
Alternative 2 No Federal Action = NEPA Baseline																
2015	Assist Tugboat	Propulsion	2	2004	2,046	1,526	0.31	2.9	2	4	1.1	412	10,826	3,055	1,115,048	Tier 1
		Auxiliary	2	2007	185	138	0.43	2.9	2	4	1.1	412	1,358	383	139,851	Tier 2
2016	Assist Tugboat	Propulsion	2	2004	2,046	1,526	0.31	2.9	2	4	1.1	412	10,826	3,055	1,115,048	Tier 1
		Auxiliary	2	2007	185	138	0.43	2.9	2	4	1.1	412	1,358	383	139,851	Tier 2
2017	Assist Tugboat	Propulsion	2	2004	2,046	1,526	0.31	2.9	2	4	1.1	412	10,826	3,055	1,115,048	Tier 1
		Auxiliary	2	2007	185	138	0.43	2.9	2	4	1.1	412	1,358	383	139,851	Tier 2
2020	Assist Tugboat	Propulsion	2	2017	2,046	1,526	0.31	2.9	2	4	1.1	412	10,826	3,055	1,115,048	Tier 4
		Auxiliary	2	2007	185	138	0.43	2.9	2	4	1.1	412	1,358	383	139,851	Tier 2
2026	Assist Tugboat	Propulsion	2	2017	2,046	1,526	0.31	2.9	2	4	1.1	412	10,826	3,055	1,115,048	Tier 4
		Auxiliary	2	2020	185	138	0.43	2.9	2	4	1.1	412	1,358	383	139,851	Tier 3

Table B1.37 Harbor Craft Data, Operations

			HC Characteristics							OGV Activity				HC Energy Demand			
Year	**HC Classification**	**Engine Typ**	**Engine Count per HC**	**HC Average MY**	**HC Average HP**	**HC Average kW**	**Load Factor**	**HC Activity per HC** (hr/trip)	**HC Count per OGV**	**Peak Day OGV Transit** (one-way trips/day)	**Average Day OGV Transits** (one-way trips/day)	**Average Annual OGV Transits** (one-way trips/yr)	**Peak Day HC Energy Demand** (kW-hr/day)	**Average Day HC Energy Demand** (kW-hr/day)	**Annual HC Energy Demand** (kW-hr/yr)	**Engine Tier**
Alternative 3 Reduced Project																
2015	Assist Tugboat	Propulsion	2	2004	2,046	1,526	0.31	2.9	2	4	1.1	412	10,826	3,055	1,115,048	Tier 1
		Auxiliary	2	2007	185	138	0.43	2.9	2	4	1.1	412	1,358	383	139,851	Tier 2
2016	Assist Tugboat	Propulsion	2	2004	2,046	1,526	0.31	2.9	2	4	1.1	412	10,826	3,055	1,115,048	Tier 1
		Auxiliary	2	2007	185	138	0.43	2.9	2	4	1.1	412	1,358	383	139,851	Tier 2
2017	Assist Tugboat	Propulsion	2	2004	2,046	1,526	0.31	2.9	2	4	1.1	412	10,826	3,055	1,115,048	Tier 1
		Auxiliary	2	2007	185	138	0.43	2.9	2	4	1.1	412	1,358	383	139,851	Tier 2
2020	Assist Tugboat	Propulsion	2	2017	2,046	1,526	0.31	2.9	2	5	1.3	464	13,532	3,440	1,255,782	Tier 4
		Auxiliary	2	2007	185	138	0.43	2.9	2	5	1.3	464	1,697	432	157,502	Tier 2
2026	Assist Tugboat	Propulsion	2	2017	2,046	1,526	0.31	2.9	2	5	1.3	464	13,532	3,440	1,255,782	Tier 4
		Auxiliary	2	2020	185	138	0.43	2.9	2	5	1.3	464	1,697	432	157,502	Tier 3

Notes and Source:

Applicable engine Tier is identified based on the EPA requirements for new engines and ARB harbor craft compliance schedule and average model year.

Example:

2004 MY engine (Tier 1 per EPA standards) would have to be replaced at the end of 2017, based on ARB's compliance schedule. At that time, the engine will need to be replaced with the relevant Tier engine applicable at the time (Tier 4).

Emission Factors:

EPA emission standards, which are reported as NOx+THC, were convered by Nox and HC assuming 95% and 5% are Nox and HC, respectively, per Carl Moyer Program guidelines.

SOx emission factor is based on 15 ppm fuel sulfur content.

PM2.5 is 89% of PM10, per SCAQMD 2006 Final Methodology to Calculate PM2.5 and PM 2.5 Significance Thresholds, Table 5.

CO2 and N20 emission factors are from IVL: Methodology for Calculating Emissions from Ships: Update on Emission Factors, 2004, also summarized in POLA 2009 Emissions Inventory, Appendix B. CH4 is 2% of HC, per IVL study.

There are no mitigation measures for operational HC. HC controls are implemented Port-wide via CAAP measures.

Information provided by Starcrest

Table B1.38 HC Activity, Operations

Hours required to assist OGV from pilot station to berth	1.43
Operating hours/day	16

Notes:

Assumed to equal the average of OGV transit times in Zone 1 (harbor transit) times 1.3 to account for tug movement and assist time (2011 APL EIR/EIS, Appendix E, Table 1.3-221).

Load factors and emission factors for harbor craft used in operations are the same as for those used in construction. See construction tables.

Information provided by Starcrest
Information provided by YTI

Table B1.39 Cargo Handling Equipment Activity and Emission Factors

		Engine Characteristics						Activity				Emission Factors									
Year	**Equipment Type**	**Average MY**	**Power** (kW)	**Power** (hp)	**Electric/Diesel**	**Load Factor**	**Location**	**Peak Day** (hr/day)	**Average Annual** (hr/yr)	**Peak Day Work** (kw-hr/day)	**Average Annual Work** (kw-hr/yr)	**PM10** (g/kW-hr)	**PM2.5** (g/kW-hr)	**DPM** (g/kW-hr)	**NOX** (g/kW-hr)	**SOX** (g/kW-hr)	**CO** (g/kW-hr)	**VOC** (g/kW-hr)	**CO2** (g/kW-hr)	**CH4** (g/kW-hr)	**N2O** (g/kW-hr)
Baseline																					
2012	Electric Wharf Crane	1997			electric		YTI														
	Forklift (diesel)	2006	142	191	diesel	0.30	YTI	80	5,637	3,420	240,955	0.14	0.13	0.14	6.45	0.01	1.64	0.40	761.40	0.01	0.01
	Rub-trd Gantry Crane	2005	336	451	diesel	0.20	YTI	96	21,704	6,460	1,460,425	0.10	0.09	0.10	5.06	0.01	1.57	0.38	761.40	0.01	0.01
	Sweeper	2008	179	240	diesel	0.68	YTI	6	2,086	696	253,873	0.28	0.26	0.28	6.87	0.01	2.49	0.53	718.02	0.04	0.02
	Top handler (terminal)	2005	237	318	diesel	0.59	YTI	288	50,629	40,309	7,086,169	0.08	0.07	0.08	5.62	0.01	1.63	0.41	761.40	0.01	0.01
	Top handler (TICTF)	2005	237	318	diesel	0.59	TICTF	32	6,777	4,479	948,527	0.08	0.07	0.08	5.62	0.01	1.63	0.41	761.40	0.01	0.01
	Yard tractor (terminal)	2005	150	201	diesel	0.39	YTI	1,280	171,929	74,852	10,054,091	0.05	0.05	0.05	1.82	0.01	1.53	0.15	761.40	0.00	0.01
	Yard tractor (TICTF)	2005	150	201	diesel	0.39	TICTF	128	21,758	7,485	1,272,368	0.05	0.05	0.05	1.82	0.01	1.53	0.15	761.40	0.00	0.01
										gal/day	gal/yr	(lb/1000 gal)	(lb/1000 gal)	(lb/1000 gal)	(lb/1000 gal)	(lb/1000 gal)	(lb/1000 gal)	(lb/1000 gal)	g/gal		
	Forklift (propane)		43	58	propane	0.30	YTI			6	1,726	5.00	5.00		139.00	0.35	129.00	83.00	5590		
Total 2012 Baseline																					
Proposed Project																					
2015	Electric Wharf Crane	1997			electric		YTI														
	Forklift (diesel)	2006	142	191	diesel	0.30	YTI	99	6,961	4,223	297,563	0.08	0.07	0.08	3.62	0.01	1.46	0.26	761.40	0.00	0.01
	Rub-trd Gantry Crane	2005	336	451	diesel	0.20	YTI	119	26,803	7,977	1,803,525	0.03	0.02	0.03	2.90	0.01	1.49	0.29	761.40	0.01	0.01
	Sweeper	2008	179	240	diesel	0.68	YTI	6	2,086	696	253,873	0.28	0.26	0.28	6.87	0.01	2.49	0.53	718.02	0.04	0.02
	Top handler (terminal)	2005	237	318	diesel	0.59	YTI	356	62,523	49,779	8,750,930	0.03	0.03	0.03	3.31	0.01	1.61	0.35	761.40	0.01	0.01
	Top handler (TICTF)	2005	237	318	diesel	0.59	TICTF	40	8,369	5,531	1,171,365	0.03	0.03	0.03	3.31	0.01	1.61	0.35	761.40	0.01	0.01
	Yard tractor (terminal)	2005	150	201	diesel	0.39	YTI	1,581	212,320	92,437	12,416,110	0.02	0.01	0.02	0.63	0.01	1.50	0.10	761.40	0.00	0.01
	Yard tractor (TICTF)	2005	150	201	diesel	0.39	TICTF	158	26,870	9,244	1,571,286	0.02	0.01	0.02	0.63	0.01	1.50	0.10	761.40	0.00	0.01
										ga/day	gal/yr								g/gal	(g/kW-hr)	(g/kW-hr)
	Forklift (propane)		43	58	propane	0.30	YTI			7	2,131	5.00	5.00	0.00	139.00	0.35	129.00	83.00	5590	0.02	0.00
2016	Electric Wharf Crane	1997			electric		YTI														
	Forklift (diesel)	2006	142	191	diesel	0.30	YTI	102	7,175	4,352	306,680	0.05	0.05	0.05	2.73	0.01	1.43	0.22	761.40	0.00	0.01
	Rub-trd Gantry Crane	2005	336	451	diesel	0.20	YTI	122	27,624	8,222	1,858,783	0.02	0.02	0.02	2.66	0.01	1.49	0.30	761.40	0.01	0.01
	Sweeper	2008	179	240	diesel	0.68	YTI	6	2,086	696	253,873	0.28	0.26	0.28	6.87	0.01	2.49	0.53	718.02	0.04	0.02
	Top handler (terminal)	2005	237	318	diesel	0.59	YTI	367	64,439	51,304	9,019,051	0.03	0.02	0.03	2.95	0.01	1.61	0.34	761.40	0.01	0.01
	Top handler (TICTF)	2005	237	318	diesel	0.59	TICTF	41	8,626	5,700	1,207,255	0.03	0.02	0.03	2.95	0.01	1.61	0.34	761.40	0.01	0.01
	Yard tractor (terminal)	2005	150	201	diesel	0.39	YTI	1,629	218,826	95,269	12,796,529	0.01	0.01	0.01	0.46	0.01	1.51	0.09	761.40	0.00	0.01
	Yard tractor (TICTF)	2005	150	201	diesel	0.39	TICTF	163	27,693	9,527	1,619,429	0.01	0.01	0.01	0.46	0.01	1.51	0.09	761.40	0.00	0.01
										ga/day	gal/yr								g/gal	(g/kW-hr)	(g/kW-hr)
	Forklift (propane)		43	58	propane	0.30	YTI			7	2,197	5.00	5.00	0.00	139.00	0.35	129.00	83.00	5590	0.02	0.00
2017	Electric Wharf Crane	1997			electric		YTI														
	Forklift (diesel)	2006	142	191	diesel	0.30	YTI	111	7,811	4,738	333,878	0.03	0.03	0.03	1.85	0.01	1.40	0.18	761.40	0.00	0.01
	Rub-trd Gantry Crane	2005	336	451	diesel	0.20	YTI	133	30,074	8,951	2,023,630	0.02	0.02	0.02	2.35	0.01	1.49	0.29	761.40	0.01	0.01
	Sweeper	2008	179	240	diesel	0.68	YTI	6	2,086	696	253,873	0.28	0.26	0.28	6.87	0.01	2.49	0.53	718.02	0.04	0.02
	Top handler (terminal)	2005	237	318	diesel	0.59	YTI	399	70,154	55,854	9,818,911	0.03	0.02	0.03	2.55	0.01	1.60	0.32	761.40	0.01	0.01
	Top handler (TICTF)	2005	237	318	diesel	0.59	TICTF	44	9,391	6,206	1,314,321	0.03	0.02	0.03	2.55	0.01	1.60	0.32	761.40	0.01	0.01
	Yard tractor (terminal)	2005	150	201	diesel	0.39	YTI	1,774	238,232	103,718	13,931,396	0.01	0.01	0.01	0.34	0.01	1.51	0.08	761.40	0.00	0.01

Table B1.39 Cargo Handling Equipment Activity and Emission Factors

		Engine Characteristics						Activity				Emission Factors									
Year	Equipment Type	Average MY	Power	Power	Electric/Diesel	Load Factor	Location	Peak Day	Average Annual	Peak Day Work	Average Annual Work	PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O
	Yard tractor (TICTF)	2005	150	201	diesel	0.39	TICTF	177	30,149	10,372	1,763,049	0.01	0.01	0.01	0.34	0.01	1.51	0.08	761.40	0.00	0.01
										ga/day	gal/yr								g/gal	(g/kW-hr)	(g/kW-hr)
	Forklift (propane)		43	58	propane	0.30	YTI			8	2,392	5.00	5.00	0.00	139.00	0.35	129.00	83.00	5590	0.02	0.00
2020	Electric Wharf Crane	1997			electric		YTI														
	Forklift (diesel)	2006	142	191	diesel	0.30	YTI	128	9,033	5,480	386,103	0.02	0.02	0.02	1.24	0.01	1.39	0.16	761.40	0.00	0.01
	Rub-trd Gantry Crane	2005	336	451	diesel	0.20	YTI	154	34,778	10,351	2,340,168	0.02	0.02	0.02	1.69	0.01	1.49	0.27	761.40	0.01	0.01
	Sweeper	2008	179	240	diesel	0.68	YTI	6	2,086	696	253,873	0.28	0.26	0.28	6.87	0.01	2.49	0.53	718.02	0.04	0.02
	Top handler (terminal)	2005	237	318	diesel	0.59	YTI	461	81,127	64,591	11,354,791	0.02	0.02	0.02	1.75	0.01	1.58	0.28	761.40	0.01	0.01
	Top handler (TICTF)	2005	237	318	diesel	0.59	TICTF	51	10,859	7,177	1,519,908	0.02	0.02	0.02	1.75	0.01	1.58	0.28	761.40	0.01	0.01
	Yard tractor (terminal)	2005	150	201	diesel	0.39	YTI	2,051	275,497	119,942	16,110,554	0.01	0.01	0.01	0.28	0.01	1.54	0.07	761.40	0.00	0.01
	Yard tractor (TICTF)	2005	150	201	diesel	0.39	TICTF	205	34,865	11,994	2,038,827	0.01	0.01	0.01	0.28	0.01	1.54	0.07	761.40	0.00	0.01
										ga/day	gal/yr								g/gal	(g/kW-hr)	(g/kW-hr)
	Forklift (propane)		43	58	propane	0.30	YTI			9	2,766	5.00	5.00	0.00	139.00	0.35	129.00	83.00	5590	0.02	0.00
2026	Electric Wharf Crane	1997			electric		YTI														
	Forklift (diesel)	2006	142	191	diesel	0.30	YTI	154	10,826	6,567	462,747	0.02	0.02	0.02	0.89	0.01	1.41	0.17	761.40	0.00	0.01
	Rub-trd Gantry Crane	2005	336	451	diesel	0.20	YTI	184	41,682	12,406	2,804,707	0.02	0.02	0.02	0.79	0.01	1.44	0.20	761.40	0.00	0.01
	Sweeper	2008	179	240	diesel	0.68	YTI	6	2,086	696	253,873	0.28	0.26	0.28	6.87	0.01	2.49	0.53	718.02	0.04	0.02
	Top handler (terminal)	2005	237	318	diesel	0.59	YTI	553	97,232	77,413	13,608,793	0.02	0.02	0.02	0.79	0.01	1.53	0.21	761.40	0.00	0.01
	Top handler (TICTF)	2005	237	318	diesel	0.59	TICTF	61	13,015	8,601	1,821,620	0.02	0.02	0.02	0.79	0.01	1.53	0.21	761.40	0.00	0.01
	Yard tractor (terminal)	2005	150	201	diesel	0.39	YTI	2,458	330,185	143,751	19,308,606	0.01	0.01	0.01	0.26	0.01	1.52	0.06	761.40	0.00	0.01
	Yard tractor (TICTF)	2005	150	201	diesel	0.39	TICTF	246	41,786	14,375	2,443,547	0.01	0.01	0.01	0.26	0.01	1.52	0.06	761.40	0.00	0.01
										ga/day	gal/yr								g/gal	(g/kW-hr)	(g/kW-hr)
	Forklift (propane)		43	58	propane	0.30	YTI			11	3,315	5.00	5.00	0.00	139.00	0.35	129.00	83.00	5590	0.02	0.00
Alternative 1 No Project																					
2015	Electric Wharf Crane	1997			electric		YTI	158													
	Forklift (diesel)	2006	142	191	diesel	0.30	YTI	99	6,961	4,223	297,563	0.08	0.07	0.08	3.62	0.01	1.46	0.26	761.40	0.00	0.01
	Rub-trd Gantry Crane	2005	336	451	diesel	0.20	YTI	119	26,803	7,977	1,803,525	0.03	0.02	0.03	2.90	0.01	1.49	0.29	761.40	0.01	0.01
	Sweeper	2008	179	240	diesel	0.68	YTI	6	2,086	696	253,873	0.28	0.26	0.28	6.87	0.01	2.49	0.53	718.02	0.04	0.02
	Top handler (terminal)	2005	237	318	diesel	0.59	YTI	356	62,523	49,779	8,750,930	0.03	0.03	0.03	3.31	0.01	1.61	0.35	761.40	0.01	0.01
	Top handler (TICTF)	2005	237	318	diesel	0.59	TICTF	40	8,369	5,531	1,171,365	0.03	0.03	0.03	3.31	0.01	1.61	0.35	761.40	0.01	0.01
	Yard tractor (terminal)	2005	150	201	diesel	0.39	YTI	1,581	212,320	92,437	12,416,110	0.02	0.01	0.02	0.63	0.01	1.50	0.10	761.40	0.00	0.01
	Yard tractor (TICTF)	2005	150	201	diesel	0.39	TICTF	158	26,870	9,244	1,571,286	0.02	0.01	0.02	0.63	0.01	1.50	0.10	761.40	0.00	0.01
										ga/day	gal/yr								g/gal	(g/kW-hr)	(g/kW-hr)
	Forklift (propane)		43	58	propane	0.30	YTI			7	2,131	5.00	5.00	0.00	139.00	0.35	129.00	83.00	5590	0.02	0.00
2016	Electric Wharf Crane	1997			electric		YTI														
	Forklift (diesel)	2006	142	191	diesel	0.30	YTI	102	7,175	4,352	306,680	0.05	0.05	0.05	2.73	0.01	1.43	0.22	761.40	0.00	0.01
	Rub-trd Gantry Crane	2005	336	451	diesel	0.20	YTI	122	27,624	8,222	1,858,783	0.02	0.02	0.02	2.66	0.01	1.49	0.30	761.40	0.01	0.01
	Sweeper	2008	179	240	diesel	0.68	YTI	6	2,086	696	253,873	0.28	0.26	0.28	6.87	0.01	2.49	0.53	718.02	0.04	0.02
	Top handler (terminal)	2005	237	318	diesel	0.59	YTI	367	64,439	51,304	9,019,051	0.03	0.02	0.03	2.95	0.01	1.61	0.34	761.40	0.01	0.01
	Top handler (TICTF)	2005	237	318	diesel	0.59	TICTF	41	8,626	5,700	1,207,255	0.03	0.02	0.03	2.95	0.01	1.61	0.34	761.40	0.01	0.01
	Yard tractor (terminal)	2005	150	201	diesel	0.39	YTI	1,629	218,826	95,269	12,796,529	0.01	0.01	0.01	0.46	0.01	1.51	0.09	761.40	0.00	0.01
	Yard tractor (TICTF)	2005	150	201	diesel	0.39	TICTF	163	27,693	9,527	1,619,429	0.01	0.01	0.01	0.46	0.01	1.51	0.09	761.40	0.00	0.01
										ga/day	gal/yr								g/gal	(g/kW-hr)	(g/kW-hr)
	Forklift (propane)		43	58	propane	0.30	YTI			7	2,197	5.00	5.00	0.00	139.00	0.35	129.00	83.00	5590	0.02	0.00

Table B1.39 Cargo Handling Equipment Activity and Emission Factors

		Engine Characteristics						Activity				Emission Factors									
Year	Equipment Type	Average MY	Power	Power	Electric/Diesel	Load Factor	Location	Peak Day	Average Annual	Peak Day Work	Average Annual Work	PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O
2017	Electric Wharf Crane	1997			electric		YTI														
	Forklift (diesel)	2006	142	191	diesel	0.30	YTI	105	7,394	4,486	316,064	0.03	0.03	0.03	1.85	0.01	1.40	0.18	761.40	0.00	0.01
	Rub-trd Gantry Crane	2005	336	451	diesel	0.20	YTI	126	28,469	8,473	1,915,661	0.02	0.02	0.02	2.35	0.01	1.49	0.29	761.40	0.01	0.01
	Sweeper	2008	179	240	diesel	0.68	YTI	6	2,086	696	253,873	0.28	0.26	0.28	6.87	0.01	2.49	0.53	718.02	0.04	0.02
	Top handler (terminal)	2005	237	318	diesel	0.59	YTI	378	66,411	52,874	9,295,033	0.03	0.02	0.03	2.55	0.01	1.60	0.32	761.40	0.01	0.01
	Top handler (TICTF)	2005	237	318	diesel	0.59	TICTF	42	8,889	5,875	1,244,197	0.03	0.02	0.03	2.55	0.01	1.60	0.32	761.40	0.01	0.01
	Yard tractor (terminal)	2005	150	201	diesel	0.39	YTI	1,679	225,522	98,185	13,188,101	0.01	0.01	0.01	0.34	0.01	1.51	0.08	761.40	0.00	0.01
	Yard tractor (TICTF)	2005	150	201	diesel	0.39	TICTF	168	28,540	9,818	1,668,984	0.01	0.01	0.01	0.34	0.01	1.51	0.08	761.40	0.00	0.01
										ga/day	gal/yr								g/gal	(g/kW-hr)	(g/kW-hr)
	Forklift (propane)		43	58	propane	0.30	YTI			7	2,264	5.00	5.00	0.00	139.00	0.35	129.00	83.00	5590	0.02	0.00
2020	Electric Wharf Crane	1997			electric		YTI														
	Forklift (diesel)	2006	142	191	diesel	0.30	YTI	115	8,095	4,910	346,002	0.02	0.02	0.02	1.24	0.01	1.39	0.16	761.40	0.00	0.01
	Rub-trd Gantry Crane	2005	336	451	diesel	0.20	YTI	138	31,166	9,276	2,097,117	0.02	0.02	0.02	1.69	0.01	1.49	0.27	761.40	0.01	0.01
	Sweeper	2008	179	240	diesel	0.68	YTI	6	2,086	696	253,873	0.28	0.26	0.28	6.87	0.01	2.49	0.53	718.02	0.04	0.02
	Top handler (terminal)	2005	237	318	diesel	0.59	YTI	414	72,701	57,883	10,175,478	0.02	0.02	0.02	1.75	0.01	1.58	0.28	761.40	0.01	0.01
	Top handler (TICTF)	2005	237	318	diesel	0.59	TICTF	46	9,732	6,431	1,362,050	0.02	0.02	0.02	1.75	0.01	1.58	0.28	761.40	0.01	0.01
	Yard tractor (terminal)	2005	150	201	diesel	0.39	YTI	1,838	246,884	107,485	14,437,306	0.01	0.01	0.01	0.28	0.01	1.54	0.07	761.40	0.00	0.01
	Yard tractor (TICTF)	2005	150	201	diesel	0.39	TICTF	184	31,244	10,748	1,827,073	0.01	0.01	0.01	0.28	0.01	1.54	0.07	761.40	0.00	0.01
										ga/day	gal/yr								g/gal	(g/kW-hr)	(g/kW-hr)
	Forklift (propane)		43	58	propane	0.30	YTI			8	2,478	5.00	5.00	0.00	139.00	0.35	129.00	83.00	5590	0.02	0.00
2026	Electric Wharf Crane	1997			electric		YTI														
	Forklift (diesel)	2006	142	191	diesel	0.30	YTI	136	9,575	5,809	409,288	0.02	0.02	0.02	0.89	0.01	1.41	0.17	761.40	0.00	0.01
	Rub-trd Gantry Crane	2005	336	451	diesel	0.20	YTI	163	36,867	10,972	2,480,692	0.02	0.02	0.02	0.79	0.01	1.44	0.20	761.40	0.00	0.01
	Sweeper	2008	179	240	diesel	0.68	YTI	6	2,086	696	253,873	0.28	0.26	0.28	6.87	0.01	2.49	0.53	718.02	0.04	0.02
	Top handler (terminal)	2005	237	318	diesel	0.59	YTI	489	85,999	68,470	12,036,632	0.02	0.02	0.02	0.79	0.01	1.53	0.21	761.40	0.00	0.01
	Top handler (TICTF)	2005	237	318	diesel	0.59	TICTF	54	11,511	7,608	1,611,176	0.02	0.02	0.02	0.79	0.01	1.53	0.21	761.40	0.00	0.01
	Yard tractor (terminal)	2005	150	201	diesel	0.39	YTI	2,174	292,040	127,144	17,077,972	0.01	0.01	0.01	0.26	0.01	1.52	0.06	761.40	0.00	0.01
	Yard tractor (TICTF)	2005	150	201	diesel	0.39	TICTF	217	36,958	12,714	2,161,256	0.01	0.01	0.01	0.26	0.01	1.52	0.06	761.40	0.00	0.01
										ga/day	gal/yr								g/gal	(g/kW-hr)	(g/kW-hr)
	Forklift (propane)		43	58	propane	0.30	YTI			9	2,932	5.00	5.00	0.00	139.00	0.35	129.00	83.00	5590	0.02	0.00
Alternative 2 No Federal Action																					
2015	Electric Wharf Crane	1997			electric		YTI														
	Forklift (diesel)	2006	142	191	diesel	0.30	YTI	99	6,961	4,223	297,563	0.08	0.07	0.08	3.62	0.01	1.46	0.26	761.40	0.00	0.01
	Rub-trd Gantry Crane	2005	336	451	diesel	0.20	YTI	119	26,803	7,977	1,803,525	0.03	0.02	0.03	2.90	0.01	1.49	0.29	761.40	0.01	0.01
	Sweeper	2008	179	240	diesel	0.68	YTI	6	2,086	696	253,873	0.28	0.26	0.28	6.87	0.01	2.49	0.53	718.02	0.04	0.02
	Top handler (terminal)	2005	237	318	diesel	0.59	YTI	356	62,523	49,779	8,750,930	0.03	0.03	0.03	3.31	0.01	1.61	0.35	761.40	0.01	0.01
	Top handler (TICTF)	2005	237	318	diesel	0.59	TICTF	40	8,369	5,531	1,171,365	0.03	0.03	0.03	3.31	0.01	1.61	0.35	761.40	0.01	0.01
	Yard tractor (terminal)	2005	150	201	diesel	0.39	YTI	1,581	212,320	92,437	12,416,110	0.02	0.01	0.02	0.63	0.01	1.50	0.10	761.40	0.00	0.01
	Yard tractor (TICTF)	2005	150	201	diesel	0.39	TICTF	158	26,870	9,244	1,571,286	0.02	0.01	0.02	0.63	0.01	1.50	0.10	761.40	0.00	0.01
										ga/day	gal/yr								g/gal	(g/kW-hr)	(g/kW-hr)
	Forklift (propane)		43	58	propane	0.30	YTI			7	2,131	5.00	5.00	0.00	139.00	0.35	129.00	83.00	5590	0.02	0.00

Table B1.39 Cargo Handling Equipment Activity and Emission Factors

		Engine Characteristics						Activity				Emission Factors									
Year	Equipment Type	Average MY	Power	Power	Electric/Diesel	Load Factor	Location	Peak Day	Average Annual	Peak Day Work	Average Annual Work	PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O
2016	Electric Wharf Crane	1997			electric		YTI														
	Forklift (diesel)	2006	142	191	diesel	0.30	YTI	102	7,175	4,352	306,680	0.05	0.05	0.05	2.73	0.01	1.43	0.22	761.40	0.00	0.01
	Rub-trd Gantry Crane	2005	336	451	diesel	0.20	YTI	122	27,624	8,222	1,858,783	0.02	0.02	0.02	2.66	0.01	1.49	0.30	761.40	0.01	0.01
	Sweeper	2008	179	240	diesel	0.68	YTI	6	2,086	696	253,873	0.28	0.26	0.28	6.87	0.01	2.49	0.53	718.02	0.04	0.02
	Top handler (terminal)	2005	237	318	diesel	0.59	YTI	367	64,439	51,304	9,019,051	0.03	0.02	0.03	2.95	0.01	1.61	0.34	761.40	0.01	0.01
	Top handler (TICTF)	2005	237	318	diesel	0.59	TICTF	41	8,626	5,700	1,207,255	0.03	0.02	0.03	2.95	0.01	1.61	0.34	761.40	0.01	0.01
	Yard tractor (terminal)	2005	150	201	diesel	0.39	YTI	1,629	218,826	95,269	12,796,529	0.01	0.01	0.01	0.46	0.01	1.51	0.09	761.40	0.00	0.01
	Yard tractor (TICTF)	2005	150	201	diesel	0.39	TICTF	163	27,693	9,527	1,619,429	0.01	0.01	0.01	0.46	0.01	1.51	0.09	761.40	0.00	0.01
										ga/day	gal/yr								g/gal	(g/kW-hr)	(g/kW-hr)
	Forklift (propane)		43	58	propane	0.30	YTI			7	2,197	5.00	5.00	0.00	139.00	0.35	129.00	83.00	5590	0.02	0.00
2017	Electric Wharf Crane	1997			electric		YTI														
	Forklift (diesel)	2006	142	191	diesel	0.30	YTI	105	7,394	4,486	316,064	0.03	0.03	0.03	1.85	0.01	1.40	0.18	761.40	0.00	0.01
	Rub-trd Gantry Crane	2005	336	451	diesel	0.20	YTI	126	28,469	8,473	1,915,661	0.02	0.02	0.02	2.35	0.01	1.49	0.29	761.40	0.01	0.01
	Sweeper	2008	179	240	diesel	0.68	YTI	6	2,086	696	253,873	0.28	0.26	0.28	6.87	0.01	2.49	0.53	718.02	0.04	0.02
	Top handler (terminal)	2005	237	318	diesel	0.59	YTI	378	66,411	52,874	9,295,033	0.03	0.02	0.03	2.55	0.01	1.60	0.32	761.40	0.01	0.01
	Top handler (TICTF)	2005	237	318	diesel	0.59	TICTF	42	8,889	5,875	1,244,197	0.03	0.02	0.03	2.55	0.01	1.60	0.32	761.40	0.01	0.01
	Yard tractor (terminal)	2005	150	201	diesel	0.39	YTI	1,679	225,522	98,185	13,188,101	0.01	0.01	0.01	0.34	0.01	1.51	0.08	761.40	0.00	0.01
	Yard tractor (TICTF)	2005	150	201	diesel	0.39	TICTF	168	28,540	9,818	1,668,984	0.01	0.01	0.01	0.34	0.01	1.51	0.08	761.40	0.00	0.01
										ga/day	gal/yr								g/gal	(g/kW-hr)	(g/kW-hr)
	Forklift (propane)		43	58	propane	0.30	YTI			7	2,264	5.00	5.00	0.00	139.00	0.35	129.00	83.00	5590	0.02	0.00
2020	Electric Wharf Crane	1997			electric		YTI														
	Forklift (diesel)	2006	142	191	diesel	0.30	YTI	115	8,095	4,910	346,002	0.02	0.02	0.02	1.24	0.01	1.39	0.16	761.40	0.00	0.01
	Rub-trd Gantry Crane	2005	336	451	diesel	0.20	YTI	138	31,166	9,276	2,097,117	0.02	0.02	0.02	1.69	0.01	1.49	0.27	761.40	0.01	0.01
	Sweeper	2008	179	240	diesel	0.68	YTI	6	2,086	696	253,873	0.28	0.26	0.28	6.87	0.01	2.49	0.53	718.02	0.04	0.02
	Top handler (terminal)	2005	237	318	diesel	0.59	YTI	414	72,701	57,883	10,175,478	0.02	0.02	0.02	1.75	0.01	1.58	0.28	761.40	0.01	0.01
	Top handler (TICTF)	2005	237	318	diesel	0.59	TICTF	46	9,732	6,431	1,362,050	0.02	0.02	0.02	1.75	0.01	1.58	0.28	761.40	0.01	0.01
	Yard tractor (terminal)	2005	150	201	diesel	0.39	YTI	1,838	246,884	107,485	14,437,306	0.01	0.01	0.01	0.28	0.01	1.54	0.07	761.40	0.00	0.01
	Yard tractor (TICTF)	2005	150	201	diesel	0.39	TICTF	184	31,244	10,748	1,827,073	0.01	0.01	0.01	0.28	0.01	1.54	0.07	761.40	0.00	0.01
										ga/day	gal/yr								g/gal	(g/kW-hr)	(g/kW-hr)
	Forklift (propane)		43	58	propane	0.30	YTI			8	2,478	5.00	5.00	0.00	139.00	0.35	129.00	83.00	5590	0.02	0.00
2026	Electric Wharf Crane	1997			electric		YTI														
	Forklift (diesel)	2006	142	191	diesel	0.30	YTI	136	9,575	5,809	409,288	0.02	0.02	0.02	0.89	0.01	1.41	0.17	761.40	0.00	0.01
	Rub-trd Gantry Crane	2005	336	451	diesel	0.20	YTI	163	36,867	10,972	2,480,692	0.02	0.02	0.02	0.79	0.01	1.44	0.20	761.40	0.00	0.01
	Sweeper	2008	179	240	diesel	0.68	YTI	6	2,086	696	253,873	0.28	0.26	0.28	6.87	0.01	2.49	0.53	718.02	0.04	0.02
	Top handler (terminal)	2005	237	318	diesel	0.59	YTI	489	85,999	68,470	12,036,632	0.02	0.02	0.02	0.79	0.01	1.53	0.21	761.40	0.00	0.01
	Top handler (TICTF)	2005	237	318	diesel	0.59	TICTF	54	11,511	7,608	1,611,176	0.02	0.02	0.02	0.79	0.01	1.53	0.21	761.40	0.00	0.01
	Yard tractor (terminal)	2005	150	201	diesel	0.39	YTI	2,174	292,040	127,144	17,077,972	0.01	0.01	0.01	0.26	0.01	1.52	0.06	761.40	0.00	0.01
	Yard tractor (TICTF)	2005	150	201	diesel	0.39	TICTF	217	36,958	12,714	2,161,256	0.01	0.01	0.01	0.26	0.01	1.52	0.06	761.40	0.00	0.01
										ga/day	gal/yr								g/gal	(g/kW-hr)	(g/kW-hr)
	Forklift (propane)		43	58	propane	0.30	YTI			9	2,932	5.00	5.00	0.00	139.00	0.35	129.00	83.00	5590	0.02	0.00

Table B1.39 Cargo Handling Equipment Activity and Emission Factors

		Engine Characteristics						Activity				Emission Factors									
Year	Equipment Type	Average MY	Power	Power	Electric/Diesel	Load Factor	Location	Peak Day	Average Annual	Peak Day Work	Average Annual Work	PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O
Alternative 3 Reduced Project																					
2015	Electric Wharf Crane	1997			electric		YTI														
	Forklift (diesel)	2006	142	191	diesel	0.30	YTI	99	6,961	4,223	297,563	0.08	0.07	0.08	3.62	0.01	1.46	0.26	761.40	0.00	0.01
	Rub-trd Gantry Crane	2005	336	451	diesel	0.20	YTI	119	26,803	7,977	1,803,525	0.03	0.02	0.03	2.90	0.01	1.49	0.29	761.40	0.01	0.01
	Sweeper	2008	179	240	diesel	0.68	YTI	6	2,086	696	253,873	0.28	0.26	0.28	6.87	0.01	2.49	0.53	718.02	0.04	0.02
	Top handler (terminal)	2005	237	318	diesel	0.59	YTI	356	62,523	49,779	8,750,930	0.03	0.03	0.03	3.31	0.01	1.61	0.35	761.40	0.01	0.01
	Top handler (TICTF)	2005	237	318	diesel	0.59	TICTF	40	8,369	5,531	1,171,365	0.03	0.03	0.03	3.31	0.01	1.61	0.35	761.40	0.01	0.01
	Yard tractor (terminal)	2005	150	201	diesel	0.39	YTI	1,581	212,320	92,437	12,416,110	0.02	0.01	0.02	0.63	0.01	1.50	0.10	761.40	0.00	0.01
	Yard tractor (TICTF)	2005	150	201	diesel	0.39	TICTF	158	26,870	9,244	1,571,286	0.02	0.01	0.02	0.63	0.01	1.50	0.10	761.40	0.00	0.01
										ga/day	gal/yr								g/gal	(g/kW-hr)	(g/kW-hr)
	Forklift (propane)		43	58	propane	0.30	YTI			7	2,131	5.00	5.00	0.00	139.00	0.35	129.00	83.00	5590	0.02	0.00
2016	Electric Wharf Crane	1997			electric		YTI														
	Forklift (diesel)	2006	142	191	diesel	0.30	YTI	102	7,175	4,352	306,680	0.05	0.05	0.05	2.73	0.01	1.43	0.22	761.40	0.00	0.01
	Rub-trd Gantry Crane	2005	336	451	diesel	0.20	YTI	122	27,624	8,222	1,858,783	0.02	0.02	0.02	2.66	0.01	1.49	0.30	761.40	0.01	0.01
	Sweeper	2008	179	240	diesel	0.68	YTI	6	2,086	696	253,873	0.28	0.26	0.28	6.87	0.01	2.49	0.53	718.02	0.04	0.02
	Top handler (terminal)	2005	237	318	diesel	0.59	YTI	367	64,439	51,304	9,019,051	0.03	0.02	0.03	2.95	0.01	1.61	0.34	761.40	0.01	0.01
	Top handler (TICTF)	2005	237	318	diesel	0.59	TICTF	41	8,626	5,700	1,207,255	0.03	0.02	0.03	2.95	0.01	1.61	0.34	761.40	0.01	0.01
	Yard tractor (terminal)	2005	150	201	diesel	0.39	YTI	1,629	218,826	95,269	12,796,529	0.01	0.01	0.01	0.46	0.01	1.51	0.09	761.40	0.00	0.01
	Yard tractor (TICTF)	2005	150	201	diesel	0.39	TICTF	163	27,693	9,527	1,619,429	0.01	0.01	0.01	0.46	0.01	1.51	0.09	761.40	0.00	0.01
										ga/day	gal/yr								g/gal	(g/kW-hr)	(g/kW-hr)
	Forklift (propane)		43	58	propane	0.30	YTI			7	2,197	5.00	5.00	0.00	139.00	0.35	129.00	83.00	5590	0.02	0.00
2017	Electric Wharf Crane	1997			electric		YTI														
	Forklift (diesel)	2006	142	191	diesel	0.30	YTI	111	7,811	4,738	333,878	0.03	0.03	0.03	1.85	0.01	1.40	0.18	761.40	0.00	0.01
	Rub-trd Gantry Crane	2005	336	451	diesel	0.20	YTI	133	30,074	8,951	2,023,630	0.02	0.02	0.02	2.35	0.01	1.49	0.29	761.40	0.01	0.01
	Sweeper	2008	179	240	diesel	0.68	YTI	6	2,086	696	253,873	0.28	0.26	0.28	6.87	0.01	2.49	0.53	718.02	0.04	0.02
	Top handler (terminal)	2005	237	318	diesel	0.59	YTI	399	70,154	55,854	9,818,911	0.03	0.02	0.03	2.55	0.01	1.60	0.32	761.40	0.01	0.01
	Top handler (TICTF)	2005	237	318	diesel	0.59	TICTF	44	9,391	6,206	1,314,321	0.03	0.02	0.03	2.55	0.01	1.60	0.32	761.40	0.01	0.01
	Yard tractor (terminal)	2005	150	201	diesel	0.39	YTI	1,774	238,232	103,718	13,931,396	0.01	0.01	0.01	0.34	0.01	1.51	0.08	761.40	0.00	0.01
	Yard tractor (TICTF)	2005	150	201	diesel	0.39	TICTF	177	30,149	10,372	1,763,049	0.01	0.01	0.01	0.34	0.01	1.51	0.08	761.40	0.00	0.01
										ga/day	gal/yr								g/gal	(g/kW-hr)	(g/kW-hr)
	Forklift (propane)		43	58	propane	0.30	YTI			8	2,392	5.00	5.00	0.00	139.00	0.35	129.00	83.00	5590	0.02	0.00
2020	Electric Wharf Crane	1997			electric		YTI														
	Forklift (diesel)	2006	142	191	diesel	0.30	YTI	128	9,033	5,480	386,103	0.02	0.02	0.02	1.24	0.01	1.39	0.16	761.40	0.00	0.01
	Rub-trd Gantry Crane	2005	336	451	diesel	0.20	YTI	154	34,778	10,351	2,340,168	0.02	0.02	0.02	1.69	0.01	1.49	0.27	761.40	0.01	0.01
	Sweeper	2008	179	240	diesel	0.68	YTI	6	2,086	696	253,873	0.28	0.26	0.28	6.87	0.01	2.49	0.53	718.02	0.04	0.02
	Top handler (terminal)	2005	237	318	diesel	0.59	YTI	461	81,127	64,591	11,354,791	0.02	0.02	0.02	1.75	0.01	1.58	0.28	761.40	0.01	0.01
	Top handler (TICTF)	2005	237	318	diesel	0.59	TICTF	51	10,859	7,177	1,519,908	0.02	0.02	0.02	1.75	0.01	1.58	0.28	761.40	0.01	0.01
	Yard tractor (terminal)	2005	150	201	diesel	0.39	YTI	2,051	275,497	119,942	16,110,554	0.01	0.01	0.01	0.28	0.01	1.54	0.07	761.40	0.00	0.01
	Yard tractor (TICTF)	2005	150	201	diesel	0.39	TICTF	205	34,865	11,994	2,038,827	0.01	0.01	0.01	0.28	0.01	1.54	0.07	761.40	0.00	0.01
										ga/day	gal/yr								g/gal	(g/kW-hr)	(g/kW-hr)
	Forklift (propane)		43	58	propane	0.30	YTI			9	2,766	5.00	5.00	0.00	139.00	0.35	129.00	83.00	5590	0.02	0.00

Table B1.39 Cargo Handling Equipment Activity and Emission Factors

		Engine Characteristics						Activity				Emission Factors									
Year	**Equipment Type**	**Average MY**	**Power**	**Power**	**Electric/Diesel**	**Load Factor**	**Location**	**Peak Day**	**Average Annual**	**Peak Day Work**	**Average Annual Work**	**PM10**	**PM2.5**	**DPM**	**NOX**	**SOX**	**CO**	**VOC**	**CO2**	**CH4**	**N2O**
2026	Electric Wharf Crane	1997			electric		YTI														
	Forklift (diesel)	2006	142	191	diesel	0.30	YTI	154	10,826	6,567	462,747	0.02	0.02	0.02	0.89	0.01	1.41	0.17	761.40	0.00	0.01
	Rub-trd Gantry Crane	2005	336	451	diesel	0.20	YTI	184	41,682	12,406	2,804,707	0.02	0.02	0.02	0.79	0.01	1.44	0.20	761.40	0.00	0.01
	Sweeper	2008	179	240	diesel	0.68	YTI	6	2,086	696	253,873	0.28	0.26	0.28	6.87	0.01	2.49	0.53	718.02	0.04	0.02
	Top handler (terminal)	2005	237	318	diesel	0.59	YTI	553	97,232	77,413	13,608,793	0.02	0.02	0.02	0.79	0.01	1.53	0.21	761.40	0.00	0.01
	Top handler (TICTF)	2005	237	318	diesel	0.59	TICTF	61	13,015	8,601	1,821,620	0.02	0.02	0.02	0.79	0.01	1.53	0.21	761.40	0.00	0.01
	Yard tractor (terminal)	2005	150	201	diesel	0.39	YTI	2,458	330,185	143,751	19,308,606	0.01	0.01	0.01	0.26	0.01	1.52	0.06	761.40	0.00	0.01
	Yard tractor (TICTF)	2005	150	201	diesel	0.39	TICTF	246	41,786	14,375	2,443,547	0.01	0.01	0.01	0.26	0.01	1.52	0.06	761.40	0.00	0.01
										ga/day	gal/yr								g/gal	(g/kW-hr)	(g/kW-hr)
	Forklift (propane)		43	58	propane	0.30	YTI			11	3,315	5.00	5.00	0.00	139.00	0.35	129.00	83.00	5590	0.02	0.00

Notes and Source:

SOx emission factor is based on 15 ppm fuel sulfur content. OFFROAD2007 for Other Industrial Equipment.

PM2.5 is 89% of PM10, per SCAQMD 2006 Final Methodology to Calculate PM2.5 and PM 2.5 Significance Thresholds, Table 5.

CO2 and N2O emission factors for diesel equipment are from APL EIR/EIS Appendix E, Table 1.6-46, GHG Emission Factors for Diesel and LPG CHE, 2011. CH4 is 2% of HC.

Emission Factors for propane:

Criteria pollutant emission factors are from SCAQMD Annual Emission Report Guidance Document. http://www.aqmd.gov/webappl/help/aer/index.html

CO2 emission factors for propane equipment are from APL EIR/EIS Appendix E, Table 1.6-46, GHG Emission Factors for Diesel and LPG CHE, 2011.

Operating schedule: Most work is done during 2 main shifts (each 8 hours).

NO, PM, VOC, CO emission factors were obtained by running CARB's CHEI Model

Mitigation preempted by CARB regulatory requirements.

Information provided by YTI

Table B1.40 Refrigerated Containers - Genset Exhaust and Refrigerant Loss

	Genset Characteristics		Activity								Used in genset exhaust calculations.		
	Average Genset Engine Power (hp)	Load Factor	Annual TEUs	TEU Factor	Total Annual Containers	Refrigerated Containers Percent of Total Containers	Total Annual Refrigerated Containers	Percent Using Gensets	Genset Quantity (gensets/yr)	Genset Runtime (hr/genset)	Peak Day Activity Factor	Peak Daily Runtime (hr/day)	Annual Runtime (hr/yr)
Baseline													
2012	34	0.46	996,109	1.726	577,120	3.1%	17,660	25%	4,495	3.10	0.0034	47	13,935
Proposed Project													
2015	34	0.46	1,230,126	1.750	702,929	4.0%	28,047	21%	5,764	3.10	0.0035	63	17,867
2016	34	0.46	1,267,816	1.750	724,466	4.0%	28,906	21%	5,940	3.10	0.0036	66	18,414
2017	34	0.46	1,380,253	1.750	788,716	4.0%	31,470	21%	6,467	3.10	0.0036	73	20,048
2020	34	0.46	1,596,153	1.750	912,087	4.0%	36,392	21%	7,479	3.10	0.0036	85	23,183
2026	34	0.46	1,913,000	1.750	1,093,143	4.0%	43,616	21%	8,963	3.10	0.0036	101	27,786
Alternative 1 No Project													
2015	34	0.46	1,230,126	1.750	702,929	4.0%	28,047	21%	5,764	3.10	0.0035	63	17,867
2016	34	0.46	1,267,816	1.750	724,466	4.0%	28,906	21%	5,940	3.10	0.0036	66	18,414
2017	34	0.46	1,306,611	1.750	746,635	4.0%	29,791	21%	6,122	3.10	0.0036	69	18,978
2020	34	0.46	1,430,376	1.750	817,358	4.0%	32,613	21%	6,702	3.10	0.0036	76	20,776
2026	34	0.46	1,692,000	1.750	966,857	4.0%	38,578	21%	7,928	3.10	0.0036	90	24,576
Alternative 2 No Federal Action													
2015	34	0.46	1,230,126	1.750	702,929	4.0%	28,047	21%	5,764	3.10	0.0035	63	17,867
2016	34	0.46	1,267,816	1.750	724,466	4.0%	28,906	21%	5,940	3.10	0.0036	66	18,414
2017	34	0.46	1,306,611	1.750	746,635	4.0%	29,791	21%	6,122	3.10	0.0036	69	18,978
2020	34	0.46	1,430,376	1.750	817,358	4.0%	32,613	21%	6,702	3.10	0.0036	76	20,776
2026	34	0.46	1,692,000	1.750	966,857	4.0%	38,578	21%	7,928	3.10	0.0036	90	24,576
Alternative 3 Reduced Project													
2015	34	0.46	1,230,126	1.750	702,929	4.0%	28,047	21%	5,764	3.10	0.0035	63	17,867
2016	34	0.46	1,267,816	1.750	724,466	4.0%	28,906	21%	5,940	3.10	0.0036	66	18,414
2017	34	0.46	1,380,253	1.750	788,716	4.0%	31,470	21%	6,467	3.10	0.0036	73	20,048
2020	34	0.46	1,596,153	1.750	912,087	4.0%	36,392	21%	7,479	3.10	0.0036	85	23,183
2026	34	0.46	1,913,000	1.750	1,093,143	4.0%	43,616	21%	8,963	3.10	0.0036	101	27,786

Source:

1. Genset average engine power and load factors are from CARB. Airborne Toxic Control Measure for In-Use Diesel-Fueled TRU and TRU Generator Sets, and Facilities where TRUs Operate. August 2011.
   Appendix C included as an appendix to the Staff Report: Initial Statement of Reasons, Table III-1: Annual Hours of Operation, Average Engine Power and Load Factors for TRUs Eligible for ULETRU Extention
   Online: http://www.arb.ca.gov/regact/2011/tru2011/truisor.pdf
2. Genset activity information was provided by YTI.

3. YTI (Doug Hansen) - there are no TRUs (Transport Refrigeration Units with refrigeration systems powered by integral internal combustion engines). All refrigerated containers that require active refrigeration are powered by external gensets.

4. PM10 emission factor: TRU ATCM, http://www.arb.ca.gov/diesel/tru/tru.htm. Frequently Asked Questions and Guidelines for Compliance with the TRU ATCM. Tables 1 and 2. http://www.arb.ca.gov/diesel/tru/documents/faq.pdf
5. PM2.5 is 97.6% of PM10. Source: Table A, CEIDARS Table with PM2.5 Fractions (for internal combusion). SCAQMD website: http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html
6. All emission factors, except PM10, are from CalEEMod, Appendix D, Table 3.4 (based on OFFROAD2007). OFFROAD2007 was used because OFFROAD2011 does not have genset or TRU category.
   Use of OFFROAD2007 is appropriate because OFFROAD2011 updated population profiles and activity, but continued to use Offroad2007 emission factors and deterioration rates.
7. Peak day activity factor for trucks was used to estimate the peak day factor for TRUs since the gensets are used just prior to or just after truck or rail transport (most cargo would go by truck).
8. Refrigerant Loss = charge capacity (kg/container) * # containers (containers/yr) * operating emission factor (%) * dwell time onsite (days/container)
   Charge capacity was obtained from The Climate Registry General Protocol, Version 1.1. Table 16.3 Default Emission Factors for Refrigeration / Air Conditioning Equipment. 2008. 5 kg.

Operating Loss Emission Factor was obtained from United Nations Environment Programme (UNEP). Report of the Refrigeration, Air Conditioning and Heat Pumps Technical Options Committee. Table 6-5: Estimate of Approximate Refrigerant Emissions. 2010. 10% per year.

10. YTI (Doug Hansen, 7/31/2013) provided average on-site reefer dwell times: Year 2012: 3.75 days Years 2013+: 3.66 days
11. R404A refrigerant

Blen	HFC32	HFC125	HFC134a	HFC143a
R404A	na	44%	4%	52%

Table B1.40

	Used in refrigerant loss calculations.			Genset Emission Factors (g/hp-hr)									
	Refrigerant Charge (kg/container)	Operating Emission Factor (%/yr)	Dwell Time Onsite (days)	PM10	PM2.5	DPM	NOX	SOX	CO	HC	VOC	CO2	CH4
Baseline													
2012	5	10%	3.75	0.45	0.44	0.45	5.38	0.007	5.03		1.746	568.299	0.157
Proposed Project													
2015	5	10%	3.66	0.205	0.20	0.205	4.12	0.007	4.538		1.281	568.299	0.115
2016	5	10%	3.66	0.145	0.14	0.145	3.68	0.007	4.410		1.146	568.299	0.103
2017	5	10%	3.66	0.128	0.12	0.128	3.56	0.007	4.292		1.017	568.299	0.091
2020	5	10%	3.66	0.055	0.05	0.055	3.25	0.007	3.995		0.691	568.299	0.062
2026	5	10%	3.66	0.03	0.03	0.03	3.32	0.007	3.758		0.440	568.299	0.039
Alternative 1 No P													
2015	5	10%	3.66	0.205	0.20	0.205	4.12	0.007	4.538		1.281	568.299	0.115
2016	5	10%	3.66	0.145	0.14	0.145	3.68	0.007	4.41		1.146	568.299	0.103
2017	5	10%	3.66	0.128	0.12	0.128	3.56	0.007	4.292		1.017	568.299	0.091
2020	5	10%	3.66	0.055	0.05	0.055	3.25	0.007	3.995		0.691	568.299	0.062
2026	5	10%	3.66	0.03	0.03	0.03	3.32	0.007	3.758		0.44	568.299	0.039
Alternative 2 No F													
2015	5	10%	3.66	0.205	0.20	0.205	4.12	0.007	4.538		1.281	568.299	0.115
2016	5	10%	3.66	0.145	0.14	0.145	3.68	0.007	4.41		1.146	568.299	0.103
2017	5	10%	3.66	0.128	0.12	0.128	3.56	0.007	4.292		1.017	568.299	0.091
2020	5	10%	3.66	0.055	0.05	0.055	3.25	0.007	3.995		0.691	568.299	0.062
2026	5	10%	3.66	0.03	0.03	0.03	3.32	0.007	3.758		0.44	568.299	0.039
Alternative 3 Redu													
2015	5	10%	3.66	0.205	0.20	0.205	4.12	0.007	4.538		1.281	568.299	0.115
2016	5	10%	3.66	0.145	0.14	0.145	3.68	0.007	4.41		1.146	568.299	0.103
2017	5	10%	3.66	0.128	0.12	0.128	3.56	0.007	4.292		1.017	568.299	0.091
2020	5	10%	3.66	0.055	0.05	0.055	3.25	0.007	3.995		0.691	568.299	0.062
2026	5	10%	3.66	0.03	0.03	0.03	3.32	0.007	3.758		0.44	568.299	0.039

Table B1.41 Wharf Cranes Activity and Emission Factors

	Activity			Emission Factors (lb/kW-hr)		
	Annual TEUs	Electrical Energy Consumption (kW-hr)	Energy Consumption Factor (kW-hr/TEU)	CO2	CH4	N2O
Baseline						
2012	996,109	3,820,800	3.84	0.65868	0.00002894	0.00000617
Proposed Project						
2015	1,230,126	4,718,425	3.84	0.65868	0.00002894	0.00000617
2016	1,267,816	4,862,993	3.84	0.65868	0.00002894	0.00000617
2017	1,380,253	5,294,271	3.84	0.65868	0.00002894	0.00000617
2020	1,596,153	6,122,404	3.84	0.65868	0.00002894	0.00000617
2026	1,913,000	7,337,742	3.84	0.65868	0.00002894	0.00000617
Alternative 1 No Project						
2015	1,230,126	4,718,425	3.84	0.65868	0.00002894	0.00000617
2016	1,267,816	4,862,993	3.84	0.65868	0.00002894	0.00000617
2017	1,306,611	5,011,800	3.84	0.65868	0.00002894	0.00000617
2020	1,430,376	5,486,529	3.84	0.65868	0.00002894	0.00000617
2026	1,692,000	6,490,046	3.84	0.65868	0.00002894	0.00000617
Alternative 2 No Federal Action						
2015	1,230,126	4,718,425	3.84	0.65868	0.00002894	0.00000617
2016	1,267,816	4,862,993	3.84	0.65868	0.00002894	0.00000617
2017	1,306,611	5,011,800	3.84	0.65868	0.00002894	0.00000617
2020	1,430,376	5,486,529	3.84	0.65868	0.00002894	0.00000617
2026	1,692,000	6,490,046	3.84	0.65868	0.00002894	0.00000617
Alternative 3 Reduced Project						
2015	1,230,126	4,718,425	3.84	0.65868	0.00002894	0.00000617
2016	1,267,816	4,862,993	3.84	0.65868	0.00002894	0.00000617
2017	1,380,253	5,294,271	3.84	0.65868	0.00002894	0.00000617
2020	1,596,153	6,122,404	3.84	0.65868	0.00002894	0.00000617
2026	1,913,000	7,337,742	3.84	0.65868	0.00002894	0.00000617

Source:
Emission factors: The Climate Registry. General Protocol v.2 Update Tables, Table 14.1 US Emission Factors by eGRID Subregion. Updated April 2013.
Electrical energy consumption in 2012 was provided by YTI.
Electrical energy consumption factor was calculated based on YTI projections.

Table B1.42 TRU Activity and Emission Factors

	Activity					Emission Factors (lb/kW-hr)		
	Total Annual Refrigerated Containers	TEU Factor	Reefer Dwell Time (days)	Average Energy Consumption Factor (kW/TEU)	Annual Electrical Energy Consumption (kW-hr)	CO2	CH4	N2O
Baseline								
2012	17,660	1.726	3.75	5.50	15,088,063	0.65868	0.0000289	0.00000617
Proposed Project								
2015	28,047	1.750	3.66	5.50	23,712,509	0.65868	0.0000289	0.00000617
2016	28,906	1.750	3.66	5.50	24,439,040	0.65868	0.0000289	0.00000617
2017	31,470	1.750	3.66	5.50	26,606,430	0.65868	0.0000289	0.00000617
2020	36,392	1.750	3.66	5.50	30,768,224	0.65868	0.0000289	0.00000617
2026	43,616	1.750	3.66	5.50	36,875,922	0.65868	0.0000289	0.00000617
Alternative 1 No Project								
2015	28,047	1.750	3.66	5.50	23,712,509	0.65868	0.0000289	0.00000617
2016	28,906	1.750	3.66	5.50	24,439,040	0.65868	0.0000289	0.00000617
2017	29,791	1.750	3.66	5.50	25,186,871	0.65868	0.0000289	0.00000617
2020	32,613	1.750	3.66	5.50	27,572,626	0.65868	0.0000289	0.00000617
2026	38,578	1.750	3.66	5.50	32,615,818	0.65868	0.0000289	0.00000617
Alternative 2 No Federal Action								
2015	28,047	1.750	3.66	5.50	23,712,509	0.65868	0.0000289	0.00000617
2016	28,906	1.750	3.66	5.50	24,439,040	0.65868	0.0000289	0.00000617
2017	29,791	1.750	3.66	5.50	25,186,871	0.65868	0.0000289	0.00000617
2020	32,613	1.750	3.66	5.50	27,572,626	0.65868	0.0000289	0.00000617
2026	38,578	1.750	3.66	5.50	32,615,818	0.65868	0.0000289	0.00000617
Alternative 3 Reduced Project								
2015	28,047	1.750	3.66	5.50	23,712,509	0.65868	0.0000289	0.00000617
2016	28,906	1.750	3.66	5.50	24,439,040	0.65868	0.0000289	0.00000617
2017	31,470	1.750	3.66	5.50	26,606,430	0.65868	0.0000289	0.00000617
2020	36,392	1.750	3.66	5.50	30,768,224	0.65868	0.0000289	0.00000617
2026	43,616	1.750	3.66	5.50	36,875,922	0.65868	0.0000289	0.00000617

Source:
1. YTI (Doug Hansen, 7/31/2013) provided average on-site reefer dwell times: Year 2012: 3.75 days Years 2013+: 3.66 days
2. Reefer power consumption factor: Container Handbook, Cargo Loss Prevention Information from German Marine Insurers.
http://www.containerhandbuch.de/chb_e/wild/index.html?/chb_e/wild/wild_08_01_02.html
5.5 kW/TEU
Emission factors: The Climate Registry. General Protocol v.2 Update Tables, Table 14.1 US Emission Factors by eGRID Subregion. Updated April 2013.

Table B1.43 On-Dock Train Trips

Year	Annual On-Dock Train Trips			Peak Daily On-Dock Train Trips		
	No. of Trains (trains/yr)	Average Length (ft/train)	Average Consist Size (locos/train)	No. of Trains (trains/day)	Average Length (ft/train)	Average Consist Size (locos/train)
CEQA Baseline						
2012	725	8,000	4.00	3	8,000	4.00
Proposed Project / Alternative 3 (Reduced Project)						
2017	916	8,660	4.33	3	8,667	4.33
2020	1,059	8,660	4.33	4	9,000	4.50
2026	1,269	8,660	4.33	5	8,800	4.40
Alternative 1 (No Project) / Alternative 2 (No Federal Action)						
2017	867	8,660	4.33	3	8,667	4.33
2020	949	8,660	4.33	3	8,667	4.33
2026	1,075	8,660	4.33	4	9,000	4.50

Notes:

1. Train activity data are summarized from the the QuickTrip - Train Builder Model.

Table B1.44 Off-Dock Train Trips

Year	Annual Off-Dock Train Trips			Peak Daily Off-Dock Train Trips		
	No. of Trains (trains/yr)	Average Length (ft/train)	Average Consist Size (locos/train)	No. of Trains (trains/day)	Average Length (ft/train)	Average Consist Size (locos/train)
CEQA Baseline						
2012	178	8,000	4.00	0.5	8,000	4.00
Proposed Project / Alternative 3 (Reduced Project)						
2017	136	8,333	4.17	0.4	8,333	4.17
2020	157	8,333	4.17	0.5	8,333	4.17
2026	189	8,333	4.17	0.6	8,333	4.17
Alternative 1 (No Project) / Alternative 2 (No Federal Action)						
2017	129	8,333	4.17	0.4	8,333	4.17
2020	141	8,333	4.17	0.4	8,333	4.17
2026	217	8,333	4.17	0.7	8,333	4.17

Notes:

1. Train activity data are summarized from the the QuickTrip - Train Builder Model.

Table B1.45 Train Travel within the SCAB

Year	Annual Train Travel by Train Length (train-miles/yr)				Total Annual Train Travel (gross ton-mi/yr)	Peak Daily Train Travel by Train Length (train-miles/day)				Total Peak Day Train Travel (gross ton-mi/day)
	12,000 ft	10,000 ft	8,000 ft	6,000 ft		12,000 ft	10,000 ft	8,000 ft	6,000 ft	
CEQA Baseline										
2012	0	30,517	40,689	30,517	8.14E+08	0	131	137	131	3.20E+06
Proposed Project / Alternative 3 (Reduced Project)										
2017	0	37,507	83,580	0	1.04E+09	0	124	270	0	3.39E+06
2020	0	43,374	96,653	0	1.21E+09	0	241	276	0	4.61E+06
2026	0	51,983	115,840	0	1.45E+09	0	242	401	0	5.63E+06
Alternative 1 (No Project) / Alternative 2 (No Federal Action)										
2017	0	35,506	79,120	0	9.88E+08	0	123	268	0	3.37E+06
2020	0	38,869	86,615	0	1.08E+09	0	124	271	0	3.41E+06
2026	0	45,035	103,255	0	1.28E+09	0	244	292	0	4.78E+06

Notes:

1. Train weight is approximately 1 gross ton per foot of length (HDR, Bill Burgel email, 8/12/2010).
2. Train miles are summarized from the the QuickTrip - Train Builder Model.

Table B1.46 Train Travel between the SCAB Boundary and CA Border

Year	Annual No. of Trains Crossing the SCAB Boundary (trains/yr)				Percent of Trains by Carrier		Train Travel Distance (mi/train)			Total Annual Train Travel (gross ton-mi/yr)
	12,000 ft	10,000 ft	8,000 ft	6,000 ft	BNSF	UP	BNSF	UP	Weighted Average	
CEQA Baseline										
2012	0	280	373	280	60%	40%	191	184	188	1.40E+09
Proposed Project / Alternative 3 (Reduced Project)										
2017	0	338	753	0	52%	48%	191	184	188	1.76E+09
2020	0	391	871	0	52%	48%	191	184	188	2.04E+09
2026	0	468	1,044	0	52%	48%	191	184	188	2.45E+09
Alternative 1 (No Project) / Alternative 2 (No Federal Action)										
2017	0	320	713	0	52%	48%	191	184	188	1.67E+09
2020	0	350	781	0	52%	48%	191	184	188	1.83E+09
2026	0	407	933	0	52%	48%	191	184	188	2.16E+09

Notes:

1. Train weight is approximately 1 gross ton per foot of length (HDR, Bill Burgel email, 8/12/2010).
2. Train miles are summarized from the the QuickTrip - Train Builder Model.
3. The distances from the SCAB boundary to California border were measured with Google Earth.

Table B1.47 Container Throughput by Rail

Year	Terminal Throughput (TEU/yr)	Annual TEUs by Rail	
		On-Dock (TEU/yr)	Off-Dock (TEU/yr)
CEQA Baseline			
2012	996,109	348,638	85,674
Proposed Project / Alternative 3 (Reduced Project)			
2015	1,230,126	430,544	61,506
2016	1,267,816	443,736	63,391
2017	1,380,253	483,089	69,013
2020	1,596,153	558,654	79,808
2026	1,913,000	669,550	95,650
Alternative 1 (No Project) / Alternative 2 (No Federal Action)			
2015	1,230,126	430,544	61,506
2016	1,267,816	443,736	63,391
2017	1,306,611	457,314	65,331
2020	1,430,376	500,632	71,519
2026	1,692,000	567,000	109,800

Notes:

1. Annual TEUs by rail for 2012, 2017, 2020, and 2026 were provided by Cambridge Systematics (Chiranjivi Bhamidipati, August 14, 2013).
2. TEUs by rail for 2015 and 2016 were scaled from 2017 data by terminal throughput.

Table B1.48 Line Haul Locomotive Activity On-Port and Within Off-Dock Rail Yards

Year	Average Line Haul Locomotive Size (hp)	On-Dock Line Haul Locomotive load factor	Locomotive Operating Hours on Port (hr/loco per train)	Line Haul Locomotive Activity On-Port				Line Haul Locomotive Activity Within Off-Dock Rail Yards			
				Annual No. of Locomotives (locos/yr)	Peak Daily No. of Locomotives (locos/day)	Annual Work Done by Locomotives (hp-hr/yr)	Peak Daily Work Done by Locomotives (hp-hr/day)	Annual No. of Locomotives (locos/yr)	Peak Daily No. of Locomotives (locos/day)	Annual Work Done by Locomotives (hp-hr/yr)	Peak Daily Work Done by Locomotives (hp-hr/day)
CEQA Baseline											
2012	4,000	0.28	1.75	2,902	12	5.64E+06	2.33E+04	713	2.1	1.39E+06	4.05E+03
Proposed Project / Alternative 3 (Reduced Project)											
2015	4,000	0.28	1.75	3,534	13	6.86E+06	2.53E+04	505	1.5	9.82E+05	3.00E+03
2016	4,000	0.28	1.75	3,642	13	7.07E+06	2.53E+04	521	1.6	1.01E+06	3.09E+03
2017	4,000	0.28	1.75	3,965	13	7.70E+06	2.53E+04	567	1.7	1.10E+06	3.37E+03
2020	4,000	0.28	1.75	4,585	18	8.91E+06	3.50E+04	656	2.0	1.27E+06	3.90E+03
2026	4,000	0.28	1.75	5,495	22	1.07E+07	4.27E+04	786	2.4	1.53E+06	4.67E+03
Alternative 1 (No Project) / Alternative 2 (No Federal Action)											
2015	4,000	0.28	1.75	3,534	13	6.86E+06	2.53E+04	505	1.5	9.82E+05	3.00E+03
2016	4,000	0.28	1.75	3,642	13	7.07E+06	2.53E+04	521	1.6	1.01E+06	3.09E+03
2017	4,000	0.28	1.75	3,753	13	7.29E+06	2.53E+04	537	1.6	1.04E+06	3.19E+03
2020	4,000	0.28	1.75	4,109	13	7.98E+06	2.53E+04	588	1.8	1.14E+06	3.49E+03
2026	4,000	0.28	1.75	4,654	18	9.04E+06	3.50E+04	902	2.8	1.75E+06	5.36E+03

Notes:

1. The line haul locomotive load factor is consistent with the POLA Inventory of Air Emissions - 2012. The load factor corresponds to the EPA line haul locomotive duty cycle.
2. The line haul locomotive operating hours on port is consistent with the POLA Inventory of Air Emissions - 2012, and is the average of eastbound (2.5 hr) and westbound (1 hr).
3. Off-dock locomotive activity assumes the same locomotive size, load factor, and operating hours per locomotive as on-port activity.
4. The annual numbers of locomotives in 2015 and 2016 were scaled from 2017 values by the annual TEUs by rail. Peak daily numbers of on-port locomotives were conservatively assumed to be equal to 2017 values.

Table B1.49 Peak Daily Line Haul Locomotive Work - Train Travel within the SCAB

Year	Peak Day Train Travel (gross ton-mi/day)	Fuel consumption factor for Class I railroads (gal/thousand gross ton-mi) [1]	Fuel consumption rate - Line haul locomotive (bhp-hr/gal) [2]	Peak Daily Work Done by Line Haul Locomotives (hp-hr/day)
CEQA Baseline				
2012	3.20E+06	0.999	20.8	66,394
Proposed Project / Alternative 3 (Reduced Project)				
2015	3.35E+06	0.999	20.8	69,640
2016	3.36E+06	0.999	20.8	69,866
2017	3.39E+06	0.999	20.8	70,543
2020	4.61E+06	0.999	20.8	95,889
2026	5.63E+06	0.999	20.8	116,983
Alternative 1 (No Project) / Alternative 2 (No Federal Action)				
2015	3.35E+06	0.999	20.8	69,640
2016	3.36E+06	0.999	20.8	69,866
2017	3.37E+06	0.999	20.8	70,125
2020	3.41E+06	0.999	20.8	70,827
2026	4.78E+06	0.999	20.8	99,289

Notes:
1. Source: POLA Inventory of Air Emissions - 2012, pg. 123.
2. Source: EPA Technical Highlights: Emission Factors for Locomotives, EPA-420-F-09-025. April 2009.
3. The gross ton-miles in 2015 and 2016 were scaled from 2017 values by the ratio of peak daily no. of locomotives (on-dock and off-dock).

Table B1.50 Annual Line Haul Locomotive Work - Train Travel within California

Year	Annual Train Travel (gross ton-mi/yr)	Fuel consumption factor for Class I railroads (gal/thousand gross ton-mi) [1]	Fuel consumption rate - Line haul locomotive (bhp-hr/gal) [2]	Annual Work Done by Line Haul Locomotives (hp-hr/yr)
CEQA Baseline				
2012	2.22E+09	0.999	20.8	4.61E+07
Proposed Project / Alternative 3 (Reduced Project)				
2015	2.50E+09	0.999	20.8	5.20E+07
2016	2.58E+09	0.999	20.8	5.36E+07
2017	2.81E+09	0.999	20.8	5.84E+07
2020	3.25E+09	0.999	20.8	6.75E+07
2026	3.89E+09	0.999	20.8	8.09E+07
Alternative 1 (No Project) / Alternative 2 (No Federal Action)				
2015	2.50E+09	0.999	20.8	5.20E+07
2016	2.58E+09	0.999	20.8	5.36E+07
2017	2.66E+09	0.999	20.8	5.52E+07
2020	2.91E+09	0.999	20.8	6.05E+07
2026	3.44E+09	0.999	20.8	7.15E+07

Notes:
1. Source: POLA Inventory of Air Emissions - 2012, pg. 123.
2. Source: EPA Technical Highlights: Emission Factors for Locomotives, EPA-420-F-09-025. April 2009.
3. The gross ton-miles in 2015 and 2016 were scaled from 2017 values by the ratio of peak daily no. of locomotives (on-dock and off-dock).

Table B1.51 Yard Locomotive Activity

	Daily TEUs Handled at On-Dock Rail Yard			On-Dock PHL Yard Locomotive Use		Yard Locomotive Average In-Use Horsepower (bhp)	Work Done by Yard Locomotives On-Dock		Work Done by Yard Locomotives Off-Dock	
Year	Average Day (TEU/day)	Peak Day Factor	Peak Day (TEU/day)	Average Day (loco-hr/day)	Peak Day (loco-hr/day)		Annual (hp-hr/yr)	Peak Day (hp-hr/day)	Annual (hp-hr/yr)	Peak Day (hp-hr/day)
CEQA Baseline										
2012	955	1.08	1,032	5.7	6.2	240	4.99E+05	1.48E+03	1.23E+05	3.63E+02
Proposed Project / Alternative 3 (Reduced Project)										
2015	1,180	1.08	1,274	7.0	7.6	240	6.17E+05	1.82E+03	8.81E+04	2.61E+02
2016	1,216	1.08	1,313	7.3	7.8	240	6.36E+05	1.88E+03	9.08E+04	2.69E+02
2017	1,324	1.08	1,429	7.9	8.5	240	6.92E+05	2.05E+03	9.88E+04	2.92E+02
2020	1,531	1.08	1,653	9.1	9.9	240	8.00E+05	2.37E+03	1.14E+05	3.38E+02
2026	1,834	1.08	1,981	10.9	11.8	240	9.59E+05	2.84E+03	1.37E+05	4.05E+02
Alternative 1 (No Project) / Alternative 2 (No Federal Action)										
2015	1,180	1.08	1,274	7.0	7.6	240	6.17E+05	1.82E+03	8.81E+04	2.61E+02
2016	1,216	1.08	1,313	7.3	7.8	240	6.36E+05	1.88E+03	9.08E+04	2.69E+02
2017	1,253	1.08	1,353	7.5	8.1	240	6.55E+05	1.94E+03	9.36E+04	2.77E+02
2020	1,372	1.08	1,481	8.2	8.8	240	7.17E+05	2.12E+03	1.02E+05	3.03E+02
2026	1,553	1.08	1,678	9.3	10.0	240	8.12E+05	2.40E+03	1.57E+05	4.65E+02

Notes:
1. Yard locomotive use is assumed to be proportional to the TEUs moved by rail.
2. Yard locomotive average in-use horsepower is derived from event recorder data provided by PHL (POLA 2007 Emission Inventory, page 138-139).
3. Work done by yard locomotives off-dock is scaled from work done on-dock by the annual TEUs by rail on-dock v. off-dock.

Table B1.52 Emission Factors for Project-Related Line Haul Locomotives

	Emission Factors (g/bhp-hr)								
Year	**VOC**	**CO**	**NOx**	**SOx**	**PM10**	**PM2.5**	**CO2**	**N2O**	**CH4**
2012	0.36	1.28	5.96	0.023	0.20	0.18	494	0.013	0.040
2013	0.33	1.28	5.96	0.005	0.18	0.17	494	0.013	0.040
2014	0.31	1.28	5.96	0.005	0.17	0.16	494	0.013	0.040
2015	0.29	1.28	5.96	0.005	0.16	0.15	494	0.013	0.040
2016	0.26	1.28	5.82	0.005	0.15	0.14	494	0.013	0.040
2017	0.23	1.28	5.48	0.005	0.14	0.13	494	0.013	0.040
2018	0.21	1.28	5.19	0.005	0.13	0.12	494	0.013	0.040
2019	0.20	1.28	4.95	0.005	0.12	0.11	494	0.013	0.040
2020	0.18	1.28	4.76	0.005	0.11	0.10	494	0.013	0.040
2021	0.17	1.28	4.52	0.005	0.11	0.10	494	0.013	0.040
2022	0.16	1.28	4.28	0.005	0.10	0.09	494	0.013	0.040
2023	0.15	1.28	4.04	0.005	0.09	0.08	494	0.013	0.040
2024	0.14	1.28	3.80	0.005	0.08	0.08	494	0.013	0.040
2025	0.13	1.28	3.56	0.005	0.08	0.07	494	0.013	0.040
2026	0.13	1.28	3.32	0.005	0.07	0.07	494	0.013	0.040
2027	0.12	1.28	3.13	0.005	0.07	0.06	494	0.013	0.040
2028	0.11	1.28	2.93	0.005	0.06	0.06	494	0.013	0.040
2029	0.10	1.28	2.74	0.005	0.05	0.05	494	0.013	0.040
2030	0.10	1.28	2.55	0.005	0.05	0.04	494	0.013	0.040
2031	0.09	1.28	2.36	0.005	0.05	0.04	494	0.013	0.040
2032	0.08	1.28	2.21	0.005	0.04	0.04	494	0.013	0.040
2033	0.08	1.28	2.07	0.005	0.04	0.04	494	0.013	0.040
2034	0.07	1.28	1.92	0.005	0.03	0.03	494	0.013	0.040
2035	0.07	1.28	1.78	0.005	0.03	0.03	494	0.013	0.040
2036	0.06	1.28	1.68	0.005	0.03	0.03	494	0.013	0.040
2037	0.06	1.28	1.59	0.005	0.03	0.03	494	0.013	0.040
2038	0.06	1.28	1.49	0.005	0.02	0.02	494	0.013	0.040
2039	0.06	1.28	1.39	0.005	0.02	0.02	494	0.013	0.040
2040	0.05	1.28	1.35	0.005	0.02	0.02	494	0.013	0.040

Notes:

1. Emission factors for VOC, NOx, and PM10 were calculated from g/gal factors published in EPA Technical Highlights: Emission Factors for Locomotives, EPA-420-F-09-025, April 2009, except for NOx in 2012-2015. NOx emission factors in 2012-2015 reflect compliance with the 2005 MOU, and are based on the 2011 compliance report (the latest available). By 2016, the EPA emission factors become cleaner than the MOU emission factor; therefore, national fleet average emission factors for NOx were used starting in 2016.
2. VOC emission factors equal 1.053 x HC emission factors, per EPA Regulatory Impact Analysis: Control of Emissions of Air Pollution from Locomotive Engines and Marine Compression Ignition Engines Less than 30 Liters Per Cylinder, EPA-420-R-08-001a, May 2008, page 3-77.
3. Emission factor for CO from EPA Locomotive Emission Standards - Regulatory Support Document, April 1998.
4. PM2.5 emissions are assumed to be 92% of PM10 emissions (POLA 2012 Air Emissions Inventory, pg. 115).
5. GHG emissions factors (CO2, N2O, and CH4) are from the POLA 2012 Air Emissions Inventory, Table 6.6.
6. PM, PM10, and DPM emissions from locomotives are assumed to be equivalent (POLA 2012 Air Emissions Inventory, pg. 115).
7. Emission factors for SOx were calculated using mass balance based on fuel sulfur content, assuming all sulfur is converted to SO2. The average line haul locomotive fuel mixture is assumed to be 100% out of state fuel for arriving locomotives, and 90% California ULSD and 10% out of state fuel for departing locomotives. (Starcrest, personal communication with Joseph Ray, April 12, 2013).
8. California ULSD fuel is assumed to have an average sulfur content of 15 ppm for all project analysis years. Out of state fuel is assumed to have an average sulfur content of 123 ppm through 2012, and 15 ppm starting 2013 in response to the EPA Nonroad Diesel Fuel Rule (15 ppm in-use is required by 12/1/2012). The 2012 EPA diesel fuel sulfur content is from Table 3.4-8a of EPA's Final Regulatory Analysis: Control of Emissions from Nonroad Diesel Engines, EPA-420-R-04-007, May 2004.
9. Emission factors assume a line haul locomotive fuel consumption rate of 20.8 bhp-hr per gallon of fuel, from EPA Technical Highlights: Emission Factors for Locomotives, EPA-420-F-09-025, April 2009.

Table B1.53 Emission Factors for Off-Dock Switch Locomotives

	Emission Factors (g/bhp-hr)								
Year	**VOC**	**CO**	**NOx**	**SOx**	**PM10**	**PM2.5**	**CO2**	**N2O**	**CH4**
2012	0.92	1.83	14.93	0.006	0.34	0.31	678	0.017	0.050
2013	0.92	1.83	14.80	0.006	0.33	0.30	678	0.017	0.050
2014	0.88	1.83	14.28	0.006	0.32	0.29	678	0.017	0.050
2015	0.87	1.83	14.14	0.006	0.32	0.29	678	0.017	0.050
2016	0.83	1.83	13.68	0.006	0.30	0.28	678	0.017	0.050
2017	0.82	1.83	13.55	0.006	0.30	0.27	678	0.017	0.050
2018	0.80	1.83	13.29	0.006	0.29	0.27	678	0.017	0.050
2019	0.79	1.83	13.16	0.006	0.29	0.27	678	0.017	0.050
2020	0.73	1.83	12.30	0.006	0.27	0.25	678	0.017	0.050
2021	0.72	1.83	12.17	0.006	0.26	0.24	678	0.017	0.050
2022	0.68	1.83	11.64	0.006	0.26	0.24	678	0.017	0.050
2023	0.66	1.83	11.32	0.006	0.24	0.22	678	0.017	0.050
2024	0.62	1.83	10.66	0.006	0.23	0.21	678	0.017	0.050
2025	0.55	1.83	9.87	0.006	0.21	0.19	678	0.017	0.050
2026	0.53	1.83	9.47	0.006	0.20	0.19	678	0.017	0.050
2027	0.51	1.83	9.08	0.006	0.20	0.18	678	0.017	0.050
2028	0.48	1.83	8.68	0.006	0.18	0.17	678	0.017	0.050
2029	0.45	1.83	8.29	0.006	0.18	0.16	678	0.017	0.050
2030	0.43	1.83	7.83	0.006	0.16	0.15	678	0.017	0.050
2031	0.40	1.83	7.37	0.006	0.16	0.15	678	0.017	0.050
2032	0.38	1.83	6.91	0.006	0.14	0.13	678	0.017	0.050
2033	0.35	1.83	6.45	0.006	0.14	0.13	678	0.017	0.050
2034	0.33	1.83	5.99	0.006	0.13	0.12	678	0.017	0.050
2035	0.30	1.83	5.53	0.006	0.11	0.10	678	0.017	0.050
2036	0.28	1.83	5.07	0.006	0.11	0.10	678	0.017	0.050
2037	0.26	1.83	4.67	0.006	0.10	0.09	678	0.017	0.050
2038	0.25	1.83	4.41	0.006	0.09	0.08	678	0.017	0.050
2039	0.24	1.83	4.14	0.006	0.09	0.08	678	0.017	0.050
2040	0.22	1.83	3.95	0.006	0.08	0.07	678	0.017	0.050

Notes:

1. Emission factors for VOC, NOx, and PM10 were calculated from g/gal factors published in EPA Technical Highlights: Emission Factors for Locomotives, EPA-420-F-09-025, April 2009.
2. VOC emission factors equal 1.053 x HC emission factors, per EPA Regulatory Impact Analysis: Control of Emissions of Air Pollution from Locomotive Engines and Marine Compression Ignition Engines Less than 30 Liters Per Cylinder, EPA-420-R-08-001a, May 2008, page 3-77.
3. Emission factor for CO from EPA Locomotive Emission Standards - Regulatory Support Document, April 1998.
4. PM2.5 emissions are assumed to be 92% of PM10 emissions (POLA 2012 Air Emissions Inventory, pg. 115).
5. GHG emissions factors (CO2, N2O, and CH4) are from the POLA 2012 Air Emissions Inventory, Table 6.2.
6. PM, PM10, and DPM emissions from locomotives are assumed to be equivalent (POLA 2012 Air Emissions Inventory, pg. 115).
7. Emission factors for SOx were calculated using mass balance based on fuel sulfur content, assuming all sulfur is converted to SO2. The California ULSD fuel sulfur content is 15 ppm.
8. Emission factors assume a switch locomotive fuel consumption rate of 15.2 bhp-hr per gallon of fuel, from EPA Technical Highlights: Emission Factors for Locomotives, EPA-420-F-09-025, April 2009.

Table B1.54 Emission Factors for PHL Locomotives

Analysis	PHL Locomotive Fleet Mix			PHL Composite Fleet Emission Factors (g/bhp-hr)								
Year	Tier 3/4	Gensets	Tier 4	VOC	CO	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
2012	0.727	0.273	-	0.211	1.743	4.192	0.006	0.040	0.037	678	0.017	0.050
2013	0.727	0.273	-	0.211	1.743	4.192	0.006	0.040	0.037	678	0.017	0.050
2014	0.727	0.273	-	0.211	1.743	4.192	0.006	0.040	0.037	678	0.017	0.050
2015	0.727	0.273	-	0.211	1.743	4.192	0.006	0.040	0.037	678	0.017	0.050
2016	0.727	0.273	-	0.211	1.743	4.192	0.006	0.040	0.037	678	0.017	0.050
2017	0.727	0.273	-	0.211	1.743	4.192	0.006	0.040	0.037	678	0.017	0.050
2018	0.727	0.273	-	0.211	1.743	4.192	0.006	0.040	0.037	678	0.017	0.050
2019	0.727	0.273	-	0.211	1.743	4.192	0.006	0.040	0.037	678	0.017	0.050
2020	0.727	0.273	-	0.211	1.743	4.192	0.006	0.040	0.037	678	0.017	0.050
2021	0.727	0.273	-	0.211	1.743	4.192	0.006	0.040	0.037	678	0.017	0.050
2022	0.727	0.182	0.091	0.214	1.772	3.976	0.006	0.037	0.034	678	0.017	0.050
2023	0.727	-	0.273	0.222	1.830	3.545	0.006	0.030	0.028	678	0.017	0.050
2024	0.727	-	0.273	0.222	1.830	3.545	0.006	0.030	0.028	678	0.017	0.050
2025	0.727	-	0.273	0.222	1.830	3.545	0.006	0.030	0.028	678	0.017	0.050
2026	0.727	-	0.273	0.222	1.830	3.545	0.006	0.030	0.028	678	0.017	0.050
2027	0.727	-	0.273	0.222	1.830	3.545	0.006	0.030	0.028	678	0.017	0.050
2028	0.727	-	0.273	0.222	1.830	3.545	0.006	0.030	0.028	678	0.017	0.050
2029	0.727	-	0.273	0.222	1.830	3.545	0.006	0.030	0.028	678	0.017	0.050
2030	0.727	-	0.273	0.222	1.830	3.545	0.006	0.030	0.028	678	0.017	0.050
2031	0.727	-	0.273	0.222	1.830	3.545	0.006	0.030	0.028	678	0.017	0.050
2032	0.727	-	0.273	0.222	1.830	3.545	0.006	0.030	0.028	678	0.017	0.050
2033	0.727	-	0.273	0.222	1.830	3.545	0.006	0.030	0.028	678	0.017	0.050
2034	0.727	-	0.273	0.222	1.830	3.545	0.006	0.030	0.028	678	0.017	0.050
2035	0.727	-	0.273	0.222	1.830	3.545	0.006	0.030	0.028	678	0.017	0.050
2036	0.727	-	0.273	0.222	1.830	3.545	0.006	0.030	0.028	678	0.017	0.050
2037	0.318	-	0.682	0.145	1.830	2.114	0.006	0.022	0.020	678	0.017	0.050
2038	0.136	-	0.864	0.110	1.830	1.477	0.006	0.018	0.016	678	0.017	0.050
2039	-	-	1.000	0.084	1.830	1.000	0.006	0.015	0.014	678	0.017	0.050
2040	-	-	1.000	0.084	1.830	1.000	0.006	0.015	0.014	678	0.017	0.050

Notes:

1. VOC emission factors equal 1.053 x HC emission factors, per EPA Regulatory Impact Analysis: Control of Emissions of Air Pollution from Locomotive Engines and Marine Compression Ignition Engines Less than 30 Liters Per Cylinder, EPA-420-R-08-001a, May 2008, page 3-77.
2. The Gensets are assumed to turn over to Tier 4 locomotives based on a 15-year repower schedule. Tier 3/4 locomotives are assumed to be replaced with Tier 4 locomotives after 30 years.
3. GHG emissions factors (CO2, N2O, and CH4) are from the POLA 2012 Air Emissions Inventory, Table 6.2.
4. PM2.5 emissions are assumed to be 92% of PM10 emissions (POLA 2012 Air Emissions Inventory, pg. 115).
5. PM and PM10 emissions from locomotives are assumed to be equivalent (POLA 2012 Air Emissions Inventory, pg. 115).
6. Emission factors for SOx were calculated using mass balance based on fuel sulfur content, assuming all sulfur is converted to SO2. Switcher locomotives are assumed to use 100% California ULSD with an average fuel sulfur content of 15 ppm (POLA 2012 Air Emissions Inventory, pg. 115.)
7. Emission factors for SOx assume a switch locomotive fuel consumption rate of 15.2 bbhp-hr per gallon of fuel, from EPA Technical Highlights: Emission Factors for Locomotives, EPA-420-F-09-025, April 2009.

Table B1.55 Trucks Idling On- and Off-Site

Year	Daily Trips	Annual Trips	Avg. On-Site Idling Time (min/trip)	Total On-Site Idling Time (hr/day)	Total On-Site Idling Time (hr/yr)	Avg. Off-Site Idling Time (min/trip)	Total Off-Site Idling Time (hr/day)	Total Off-Site Idling Time (hr/yr)	Percent LNG Trucks
CEQA Baseline									
2012	3,081	907,176	12	616	181,435	10	513	151,196	10%
Proposed Project / Alternative 3 (Reduced Project)									
2015	3,300	931,410	12	660	186,282	10	550	155,235	10%
2016	3,401	946,086	12	680	189,217	10	567	157,681	10%
2017	3,703	1,014,899	12	741	202,980	10	617	169,150	10%
2020	4,220	1,156,692	12	844	231,338	10	703	192,782	10%
2026	4,918	1,347,939	12	984	269,588	10	820	224,656	10%
Alternative 1 (No Project) / Alternative 2 (No Federal Action)									
2015	3,300	931,410	12	660	186,282	10	550	155,235	10%
2016	3,401	946,086	12	680	189,217	10	567	157,681	10%
2017	3,505	960,749	12	701	192,150	10	584	160,125	10%
2020	3,782	1,036,557	12	756	207,311	10	630	172,760	10%
2026	4,461	1,222,690	12	892	244,538	10	743	203,782	10%

Notes:

1. On-site iding time represents 6 minutes at the in-gate, 10 minutes on terminal, and 8 minutes at the out gate per round trip, which equates to 12 minutes per one-way trip, for all analysis years (Source: YTI, 6/7/2013).
2. Trips are one-way trips.

Table B1.56 Trucks Driving On-Site

Year	Daily Trips	Annual Trips	On-Site Driving Distance (mi/trip)	Total On-Site VMT (mi/day)	Total On-Site VMT (mi/yr)	Percent LNG Trucks
CEQA Baseline						
2012	3,081	907,176	0.75	2,311	680,382	10%
Proposed Project / Alternative 3 (Reduced Project)						
2015	3,300	931,410	0.75	2,475	698,557	10%
2016	3,401	946,086	0.75	2,551	709,564	10%
2017	3,703	1,014,899	0.75	2,777	761,174	10%
2020	4,220	1,156,692	0.75	3,165	867,519	10%
2026	4,918	1,347,939	0.75	3,688	1,010,954	10%
Alternative 1 (No Project) / Alternative 2 (No Federal Action)						
2015	3,300	931,410	0.75	2,475	698,557	10%
2016	3,401	946,086	0.75	2,551	709,564	10%
2017	3,505	960,749	0.75	2,629	720,562	10%
2020	3,782	1,036,557	0.75	2,836	777,418	10%
2026	4,461	1,222,690	0.75	3,346	917,018	10%

Notes:

1. Average on-site driving distance is 1.5 miles per truck, or 0.75 miles per one-way trip (Source: YTI, 6/7/2013).
2. Trips are one-way trips.
3. On-site driving speed is 10 mph (Source: YTI, 6/7/2013).

Table B1.57 Employee Vehicles Driving On-Site

Year	Daily Trips	Annual Trips	On-Site Driving Distance (mi/trip)	Total On-Site VMT (mi/day)	Total On-Site VMT (mi/yr)
CEQA Baseline					
2012	1,401	412,547	0.5	701	206,274
Proposed Project / Alternative 3 (Reduced Project)					
2015	1,730	488,305	0.5	865	244,152
2016	1,783	495,999	0.5	892	247,999
2017	1,941	532,075	0.5	971	266,037
2020	2,209	605,379	0.5	1,104	302,689
2026	2,535	694,813	0.5	1,268	347,407
Alternative 1 (No Project) / Alternative 2 (No Federal Action)					
2015	1,730	488,305	0.5	865	244,152
2016	1,783	495,999	0.5	892	247,999
2017	1,838	503,686	0.5	919	251,843
2020	2,209	605,379	0.5	1,104	302,689
2026	2,253	617,521	0.5	1,127	308,760

Notes:

1. Average on-site driving distance represents the distance from the guard shack to the ILWU parking lot.
2. Trips are one-way trips.
3. On-site driving speed is 10 mph (Source: YTI, 6/7/2013).

Table B1.58 Trucks and Employee Vehicles Driving Off-Site within the South Coast Air Basin

Year	Daily Trips		Daily VMT	
	Autos	Trucks	Autos	Trucks
CEQA Baseline				
2012	1,401	3,081	14,877	61,309
Proposed Project / Alternative 3 (Reduced Project)				
2015	1,730	3,300	17,963	65,978
2016	1,783	3,401	18,514	67,999
2017	1,941	3,703	20,159	74,027
2020	2,209	4,220	22,887	84,668
2026	2,535	4,918	26,255	98,567
Alternative 1 (No Project) / Alternative 2 (No Federal Action)				
2015	1,730	3,300	17,963	65,978
2016	1,783	3,401	18,514	67,999
2017	1,838	3,505	19,080	70,080
2020	2,209	3,782	22,871	75,992
2026	2,253	4,461	23,344	87,886

Notes:
1. VMT is within the South Coast Air Basin.
2. VMT was calculated link-by-link and summed. Link-based data were provided by the traffic study (CSI, personal communication with Sean McAtee, 7/19/2013).
3. Trips are one-way trips.

Table B1.59 Trucks and Employee Vehicles Driving Off-Site within California

Year	Annual Trips		Annual VMT	
	Autos	Trucks	Autos	Trucks
CEQA Baseline				
2012	412,547	907,176	4,409,151	20,897,252
Proposed Project / Alternative 3 (Reduced Project)				
2015	488,305	931,410	5,098,871	21,706,068
2016	495,999	946,086	5,179,213	22,048,077
2017	532,075	1,014,899	5,556,890	23,650,717
2020	605,379	1,156,692	6,309,006	27,109,430
2026	694,813	1,347,939	7,237,443	31,577,381
Alternative 1 (No Project) / Alternative 2 (No Federal Action)				
2015	488,305	931,410	5,098,871	21,706,068
2016	495,999	946,086	5,179,213	22,048,077
2017	503,686	960,749	5,259,492	22,389,814
2020	605,379	1,036,557	6,304,543	24,326,240
2026	617,521	1,222,690	6,434,983	28,195,559

Notes:
1. VMT is within California.
2. VMT was calculated link-by-link and summed. Link-based data were provided by the traffic study (CSI, personal communication with Sean McAtee, 7/19/2013).
3. Trips are one-way trips.

Table B1.60 Emission Factors for Diesel Drayage Trucks

		Emission Factors (g/mi) or (g/hr) for idle												
Year	Speed (mph)	VOC	CO	NOx	SOx	PM10 Exhaust	PM10 Tire Wear	PM10 Brake Wear	DPM	PM2.5 Exhaust	PM2.5 Tire & Brake Wear	CO2	N2O	CH4
2012	Idle	4.54E+00	1.66E+01	2.83E+01	3.96E-02	6.29E-02	0.00E+00	0.00E+00	6.29E-02	5.79E-02	0.00E+00	4.93E+03	1.59E-01	2.54E-01
2012	5	3.09E+00	7.34E+00	1.86E+01	1.71E-02	1.02E-01	3.60E-02	6.17E-02	1.02E-01	9.34E-02	3.55E-02	4.08E+03	5.88E-02	1.73E-01
2012	10	1.80E+00	4.59E+00	1.39E+01	1.71E-02	8.68E-02	3.60E-02	6.17E-02	8.68E-02	7.99E-02	3.55E-02	3.37E+03	5.88E-02	1.00E-01
2012	15	9.13E-01	2.68E+00	1.05E+01	1.71E-02	7.43E-02	3.60E-02	6.17E-02	7.43E-02	6.84E-02	3.55E-02	2.77E+03	5.88E-02	5.10E-02
2012	20	3.92E-01	1.47E+00	7.91E+00	1.71E-02	6.30E-02	3.60E-02	6.17E-02	6.30E-02	5.80E-02	3.55E-02	2.18E+03	5.88E-02	2.19E-02
2012	25	3.41E-01	1.38E+00	7.11E+00	1.71E-02	5.92E-02	3.60E-02	6.17E-02	5.92E-02	5.45E-02	3.55E-02	2.04E+03	5.88E-02	1.91E-02
2012	30	2.97E-01	1.32E+00	6.42E+00	1.71E-02	5.78E-02	3.60E-02	6.17E-02	5.78E-02	5.32E-02	3.55E-02	1.91E+03	5.88E-02	1.66E-02
2012	35	2.59E-01	1.28E+00	5.85E+00	1.71E-02	5.89E-02	3.60E-02	6.17E-02	5.89E-02	5.42E-02	3.55E-02	1.81E+03	5.88E-02	1.44E-02
2012	40	2.26E-01	1.26E+00	5.40E+00	1.71E-02	6.25E-02	3.60E-02	6.17E-02	6.25E-02	5.75E-02	3.55E-02	1.72E+03	5.88E-02	1.26E-02
2012	45	2.00E-01	1.27E+00	5.07E+00	1.71E-02	6.85E-02	3.60E-02	6.17E-02	6.85E-02	6.30E-02	3.55E-02	1.66E+03	5.88E-02	1.11E-02
2012	50	1.79E-01	1.31E+00	4.86E+00	1.71E-02	7.70E-02	3.60E-02	6.17E-02	7.70E-02	7.08E-02	3.55E-02	1.62E+03	5.88E-02	1.00E-02
2012	55	1.64E-01	1.37E+00	4.78E+00	1.71E-02	8.80E-02	3.60E-02	6.17E-02	8.80E-02	8.10E-02	3.55E-02	1.60E+03	5.88E-02	9.20E-03
2015	Idle	4.53E+00	1.66E+01	2.79E+01	4.06E-02	5.76E-02	0.00E+00	0.00E+00	5.76E-02	5.30E-02	0.00E+00	4.93E+03	1.63E-01	2.53E-01
2015	5	4.03E+00	9.64E+00	2.13E+01	1.67E-02	1.01E-01	3.60E-02	6.17E-02	1.01E-01	9.27E-02	3.55E-02	4.08E+03	5.74E-02	2.25E-01
2015	10	2.35E+00	6.01E+00	1.60E+01	1.67E-02	9.25E-02	3.60E-02	6.17E-02	9.25E-02	8.51E-02	3.55E-02	3.37E+03	5.74E-02	1.31E-01
2015	15	1.19E+00	3.49E+00	1.20E+01	1.67E-02	8.44E-02	3.60E-02	6.17E-02	8.44E-02	7.76E-02	3.55E-02	2.77E+03	5.74E-02	6.66E-02
2015	20	5.12E-01	1.89E+00	9.10E+00	1.67E-02	7.58E-02	3.60E-02	6.17E-02	7.58E-02	6.97E-02	3.55E-02	2.18E+03	5.74E-02	2.86E-02
2015	25	4.48E-01	1.78E+00	8.16E+00	1.67E-02	7.24E-02	3.60E-02	6.17E-02	7.24E-02	6.66E-02	3.55E-02	2.04E+03	5.74E-02	2.50E-02
2015	30	3.90E-01	1.71E+00	7.36E+00	1.67E-02	7.19E-02	3.60E-02	6.17E-02	7.19E-02	6.61E-02	3.55E-02	1.91E+03	5.74E-02	2.18E-02
2015	35	3.41E-01	1.67E+00	6.70E+00	1.67E-02	7.43E-02	3.60E-02	6.17E-02	7.43E-02	6.84E-02	3.55E-02	1.81E+03	5.74E-02	1.90E-02
2015	40	2.98E-01	1.66E+00	6.17E+00	1.67E-02	7.97E-02	3.60E-02	6.17E-02	7.97E-02	7.33E-02	3.55E-02	1.73E+03	5.74E-02	1.66E-02
2015	45	2.63E-01	1.68E+00	5.79E+00	1.67E-02	8.80E-02	3.60E-02	6.17E-02	8.80E-02	8.10E-02	3.55E-02	1.66E+03	5.74E-02	1.47E-02
2015	50	2.35E-01	1.73E+00	5.54E+00	1.67E-02	9.93E-02	3.60E-02	6.17E-02	9.93E-02	9.14E-02	3.55E-02	1.62E+03	5.74E-02	1.31E-02
2015	55	2.15E-01	1.82E+00	5.44E+00	1.67E-02	1.14E-01	3.60E-02	6.17E-02	1.14E-01	1.05E-01	3.55E-02	1.61E+03	5.74E-02	1.20E-02
2016	Idle	4.53E+00	1.66E+01	2.79E+01	4.06E-02	5.76E-02	0.00E+00	0.00E+00	5.76E-02	5.30E-02	0.00E+00	4.93E+03	1.63E-01	2.53E-01
2016	5	4.23E+00	1.01E+01	2.16E+01	1.67E-02	1.07E-01	3.60E-02	6.17E-02	1.07E-01	9.80E-02	3.55E-02	4.08E+03	5.74E-02	2.36E-01
2016	10	2.46E+00	6.30E+00	1.63E+01	1.67E-02	9.77E-02	3.60E-02	6.17E-02	9.77E-02	8.99E-02	3.55E-02	3.37E+03	5.74E-02	1.37E-01
2016	15	1.25E+00	3.66E+00	1.22E+01	1.67E-02	8.92E-02	3.60E-02	6.17E-02	8.92E-02	8.21E-02	3.55E-02	2.76E+03	5.74E-02	6.98E-02
2016	20	5.37E-01	1.98E+00	9.25E+00	1.67E-02	8.01E-02	3.60E-02	6.17E-02	8.01E-02	7.37E-02	3.55E-02	2.18E+03	5.74E-02	3.00E-02
2016	25	4.69E-01	1.87E+00	8.29E+00	1.67E-02	7.65E-02	3.60E-02	6.17E-02	7.65E-02	7.04E-02	3.55E-02	2.04E+03	5.74E-02	2.62E-02
2016	30	4.09E-01	1.79E+00	7.48E+00	1.67E-02	7.59E-02	3.60E-02	6.17E-02	7.59E-02	6.98E-02	3.55E-02	1.91E+03	5.74E-02	2.29E-02
2016	35	3.57E-01	1.75E+00	6.80E+00	1.67E-02	7.85E-02	3.60E-02	6.17E-02	7.85E-02	7.22E-02	3.55E-02	1.81E+03	5.74E-02	1.99E-02
2016	40	3.13E-01	1.74E+00	6.27E+00	1.67E-02	8.42E-02	3.60E-02	6.17E-02	8.42E-02	7.75E-02	3.55E-02	1.72E+03	5.74E-02	1.75E-02
2016	45	2.76E-01	1.76E+00	5.88E+00	1.67E-02	9.30E-02	3.60E-02	6.17E-02	9.30E-02	8.56E-02	3.55E-02	1.66E+03	5.74E-02	1.54E-02
2016	50	2.47E-01	1.82E+00	5.63E+00	1.67E-02	1.05E-01	3.60E-02	6.17E-02	1.05E-01	9.65E-02	3.55E-02	1.62E+03	5.74E-02	1.38E-02
2016	55	2.26E-01	1.90E+00	5.52E+00	1.67E-02	1.20E-01	3.60E-02	6.17E-02	1.20E-01	1.10E-01	3.55E-02	1.60E+03	5.74E-02	1.26E-02
2017	Idle	4.53E+00	1.66E+01	2.79E+01	4.07E-02	5.76E-02	0.00E+00	0.00E+00	5.76E-02	5.30E-02	0.00E+00	4.93E+03	1.63E-01	2.53E-01
2017	5	4.36E+00	1.04E+01	2.16E+01	1.67E-02	1.11E-01	3.60E-02	6.17E-02	1.11E-01	1.03E-01	3.55E-02	4.07E+03	5.73E-02	2.44E-01
2017	10	2.54E+00	6.50E+00	1.63E+01	1.67E-02	1.02E-01	3.60E-02	6.17E-02	1.02E-01	9.39E-02	3.55E-02	3.36E+03	5.73E-02	1.42E-01
2017	15	1.29E+00	3.77E+00	1.22E+01	1.67E-02	9.32E-02	3.60E-02	6.17E-02	9.32E-02	8.57E-02	3.55E-02	2.76E+03	5.73E-02	7.20E-02
2017	20	5.54E-01	2.05E+00	9.25E+00	1.67E-02	8.37E-02	3.60E-02	6.17E-02	8.37E-02	7.70E-02	3.55E-02	2.18E+03	5.73E-02	3.10E-02
2017	25	4.84E-01	1.93E+00	8.29E+00	1.67E-02	7.99E-02	3.60E-02	6.17E-02	7.99E-02	7.35E-02	3.55E-02	2.03E+03	5.73E-02	2.71E-02
2017	30	4.22E-01	1.85E+00	7.48E+00	1.67E-02	7.94E-02	3.60E-02	6.17E-02	7.94E-02	7.30E-02	3.55E-02	1.91E+03	5.73E-02	2.36E-02
2017	35	3.68E-01	1.80E+00	6.80E+00	1.67E-02	8.21E-02	3.60E-02	6.17E-02	8.21E-02	7.55E-02	3.55E-02	1.80E+03	5.73E-02	2.06E-02
2017	40	3.23E-01	1.79E+00	6.27E+00	1.67E-02	8.80E-02	3.60E-02	6.17E-02	8.80E-02	8.10E-02	3.55E-02	1.72E+03	5.73E-02	1.80E-02
2017	45	2.85E-01	1.82E+00	5.88E+00	1.67E-02	9.72E-02	3.60E-02	6.17E-02	9.72E-02	8.94E-02	3.55E-02	1.66E+03	5.73E-02	1.59E-02
2017	50	2.55E-01	1.87E+00	5.63E+00	1.67E-02	1.10E-01	3.60E-02	6.17E-02	1.10E-01	1.01E-01	3.55E-02	1.62E+03	5.73E-02	1.42E-02
2017	55	2.33E-01	1.97E+00	5.52E+00	1.67E-02	1.25E-01	3.60E-02	6.17E-02	1.25E-01	1.15E-01	3.55E-02	1.60E+03	5.73E-02	1.30E-02
2020	Idle	4.53E+00	1.66E+01	2.79E+01	4.09E-02	5.76E-02	0.00E+00	0.00E+00	5.76E-02	5.30E-02	0.00E+00	4.93E+03	1.65E-01	2.53E-01
2020	5	4.28E+00	1.02E+01	1.96E+01	1.66E-02	1.18E-01	3.60E-02	6.17E-02	1.18E-01	1.08E-01	3.55E-02	4.05E+03	5.69E-02	2.39E-01
2020	10	2.49E+00	6.38E+00	1.47E+01	1.66E-02	1.08E-01	3.60E-02	6.17E-02	1.08E-01	9.91E-02	3.55E-02	3.34E+03	5.69E-02	1.39E-01
2020	15	1.26E+00	3.70E+00	1.11E+01	1.66E-02	9.83E-02	3.60E-02	6.17E-02	9.83E-02	9.04E-02	3.55E-02	2.74E+03	5.69E-02	7.06E-02
2020	20	5.44E-01	2.01E+00	8.36E+00	1.66E-02	8.83E-02	3.60E-02	6.17E-02	8.83E-02	8.12E-02	3.55E-02	2.17E+03	5.69E-02	3.04E-02
2020	25	4.75E-01	1.89E+00	7.50E+00	1.66E-02	8.43E-02	3.60E-02	6.17E-02	8.43E-02	7.76E-02	3.55E-02	2.02E+03	5.69E-02	2.65E-02
2020	30	4.14E-01	1.82E+00	6.76E+00	1.66E-02	8.37E-02	3.60E-02	6.17E-02	8.37E-02	7.70E-02	3.55E-02	1.90E+03	5.69E-02	2.31E-02
2020	35	3.61E-01	1.77E+00	6.15E+00	1.66E-02	8.66E-02	3.60E-02	6.17E-02	8.66E-02	7.97E-02	3.55E-02	1.79E+03	5.69E-02	2.02E-02
2020	40	3.16E-01	1.76E+00	5.67E+00	1.66E-02	9.28E-02	3.60E-02	6.17E-02	9.28E-02	8.54E-02	3.55E-02	1.71E+03	5.69E-02	1.77E-02
2020	45	2.79E-01	1.78E+00	5.32E+00	1.66E-02	1.03E-01	3.60E-02	6.17E-02	1.03E-01	9.44E-02	3.55E-02	1.65E+03	5.69E-02	1.56E-02
2020	50	2.50E-01	1.84E+00	5.09E+00	1.66E-02	1.16E-01	3.60E-02	6.17E-02	1.16E-01	1.06E-01	3.55E-02	1.61E+03	5.69E-02	1.40E-02
2020	55	2.28E-01	1.93E+00	4.99E+00	1.66E-02	1.32E-01	3.60E-02	6.17E-02	1.32E-01	1.22E-01	3.55E-02	1.59E+03	5.69E-02	1.28E-02
2026	Idle	4.53E+00	1.66E+01	2.79E+01	4.09E-02	5.76E-02	0.00E+00	0.00E+00	5.76E-02	5.30E-02	0.00E+00	4.93E+03	1.65E-01	2.53E-01
2026	5	2.76E+00	6.63E+00	9.45E+00	1.66E-02	1.05E-01	3.60E-02	6.17E-02	1.05E-01	9.66E-02	3.55E-02	3.96E+03	5.69E-02	1.54E-01
2026	10	1.61E+00	4.13E+00	7.11E+00	1.66E-02	9.63E-02	3.60E-02	6.17E-02	9.63E-02	8.86E-02	3.55E-02	3.27E+03	5.69E-02	8.98E-02
2026	15	8.17E-01	2.40E+00	5.35E+00	1.66E-02	8.79E-02	3.60E-02	6.17E-02	8.79E-02	8.09E-02	3.55E-02	2.69E+03	5.69E-02	4.56E-02
2026	20	3.51E-01	1.30E+00	4.04E+00	1.66E-02	7.89E-02	3.60E-02	6.17E-02	7.89E-02	7.26E-02	3.55E-02	2.12E+03	5.69E-02	1.96E-02
2026	25	3.07E-01	1.23E+00	3.62E+00	1.66E-02	7.53E-02	3.60E-02	6.17E-02	7.53E-02	6.93E-02	3.55E-02	1.98E+03	5.69E-02	1.71E-02
2026	30	2.67E-01	1.18E+00	3.27E+00	1.66E-02	7.48E-02	3.60E-02	6.17E-02	7.48E-02	6.88E-02	3.55E-02	1.86E+03	5.69E-02	1.49E-02
2026	35	2.33E-01	1.15E+00	2.97E+00	1.66E-02	7.73E-02	3.60E-02	6.17E-02	7.73E-02	7.11E-02	3.55E-02	1.75E+03	5.69E-02	1.30E-02
2026	40	2.04E-01	1.14E+00	2.74E+00	1.66E-02	8.30E-02	3.60E-02	6.17E-02	8.30E-02	7.64E-02	3.55E-02	1.67E+03	5.69E-02	1.14E-02
2026	45	1.80E-01	1.15E+00	2.57E+00	1.66E-02	9.16E-02	3.60E-02	6.17E-02	9.16E-02	8.43E-02	3.55E-02	1.62E+03	5.69E-02	1.01E-02
2026	50	1.61E-01	1.19E+00	2.46E+00	1.66E-02	1.03E-01	3.60E-02	6.17E-02	1.03E-01	9.51E-02	3.55E-02	1.58E+03	5.69E-02	9.00E-03
2026	55	1.47E-01	1.25E+00	2.41E+00	1.66E-02	1.18E-01	3.60E-02	6.17E-02	1.18E-01	1.09E-01	3.55E-02	1.56E+03	5.69E-02	8.20E-03

Notes:

1. Emission Rates were obtained from EMFAC2011.
2. Baseline Age distribution to forecast 2015+ fleet was taken from POLA 2011 Drayage Truck (HDV) distribution.
3. 2012 Age distribution and the composite Emission Factors are same as used for POLA's 2012 Emission Inventory.
4. Ports Clean Truck Program and CARB's regulation which bans pre 2010 drayage trucks starting in January 1, 2021 are reflected.
5. Growth Factors based on file "2013 terminal allocation modified 2009 forecast YTI EIR specific 051613" send by the Port.
6. Source: Starcrest. Personal communication with Archana Agrawal. 7/24/2013.

Table B1.61 Emission Factors for Drayage Trucks Using LNG

		Emission Factors (g/mi) or (g/hr) for idle												
Year	Speed (mph)	VOC	CO	NOx	SOx	PM10 Exhaust	PM10 Tire Wear	PM10 Brake Wear	DPM	PM2.5 Exhaust	PM2.5 Tire & Brake Wear	CO2	N2O	CH4
2012	Idle	4.54E+00	1.66E+01	2.83E+01	3.96E-02	6.29E-02	0.00E+00	0.00E+00	0.00E+00	5.79E-02	0.00E+00	4.50E+03	8.75E-01	9.83E+00
2012	5	3.09E+00	7.34E+00	1.86E+01	1.71E-02	1.02E-01	3.60E-02	6.17E-02	0.00E+00	9.34E-02	3.55E-02	3.72E+03	1.75E-01	1.97E+00
2012	10	1.80E+00	4.59E+00	1.39E+01	1.71E-02	8.68E-02	3.60E-02	6.17E-02	0.00E+00	7.99E-02	3.55E-02	3.07E+03	1.75E-01	1.97E+00
2012	15	9.13E-01	2.68E+00	1.05E+01	1.71E-02	7.43E-02	3.60E-02	6.17E-02	0.00E+00	6.84E-02	3.55E-02	2.52E+03	1.75E-01	1.97E+00
2012	20	3.92E-01	1.47E+00	7.91E+00	1.71E-02	6.30E-02	3.60E-02	6.17E-02	0.00E+00	5.80E-02	3.55E-02	1.99E+03	1.75E-01	1.97E+00
2012	25	3.41E-01	1.38E+00	7.11E+00	1.71E-02	5.92E-02	3.60E-02	6.17E-02	0.00E+00	5.45E-02	3.55E-02	1.86E+03	1.75E-01	1.97E+00
2012	30	2.97E-01	1.32E+00	6.42E+00	1.71E-02	5.78E-02	3.60E-02	6.17E-02	0.00E+00	5.32E-02	3.55E-02	1.74E+03	1.75E-01	1.97E+00
2012	35	2.59E-01	1.28E+00	5.85E+00	1.71E-02	5.89E-02	3.60E-02	6.17E-02	0.00E+00	5.42E-02	3.55E-02	1.65E+03	1.75E-01	1.97E+00
2012	40	2.26E-01	1.26E+00	5.40E+00	1.71E-02	6.25E-02	3.60E-02	6.17E-02	0.00E+00	5.75E-02	3.55E-02	1.57E+03	1.75E-01	1.97E+00
2012	45	2.00E-01	1.27E+00	5.07E+00	1.71E-02	6.85E-02	3.60E-02	6.17E-02	0.00E+00	6.30E-02	3.55E-02	1.52E+03	1.75E-01	1.97E+00
2012	50	1.79E-01	1.31E+00	4.86E+00	1.71E-02	7.70E-02	3.60E-02	6.17E-02	0.00E+00	7.08E-02	3.55E-02	1.48E+03	1.75E-01	1.97E+00
2012	55	1.64E-01	1.37E+00	4.78E+00	1.71E-02	8.80E-02	3.60E-02	6.17E-02	0.00E+00	8.10E-02	3.55E-02	1.46E+03	1.75E-01	1.97E+00
2015	Idle	4.53E+00	1.66E+01	2.79E+01	4.06E-02	5.76E-02	0.00E+00	0.00E+00	0.00E+00	5.30E-02	0.00E+00	4.50E+03	8.75E-01	9.83E+00
2015	5	4.03E+00	9.64E+00	2.13E+01	1.67E-02	1.01E-01	3.60E-02	6.17E-02	0.00E+00	9.27E-02	3.55E-02	3.72E+03	1.75E-01	1.97E+00
2015	10	2.35E+00	6.01E+00	1.60E+01	1.67E-02	9.25E-02	3.60E-02	6.17E-02	0.00E+00	8.51E-02	3.55E-02	3.07E+03	1.75E-01	1.97E+00
2015	15	1.19E+00	3.49E+00	1.20E+01	1.67E-02	8.44E-02	3.60E-02	6.17E-02	0.00E+00	7.76E-02	3.55E-02	2.52E+03	1.75E-01	1.97E+00
2015	20	5.12E-01	1.89E+00	9.10E+00	1.67E-02	7.58E-02	3.60E-02	6.17E-02	0.00E+00	6.97E-02	3.55E-02	1.99E+03	1.75E-01	1.97E+00
2015	25	4.48E-01	1.78E+00	8.16E+00	1.67E-02	7.24E-02	3.60E-02	6.17E-02	0.00E+00	6.66E-02	3.55E-02	1.86E+03	1.75E-01	1.97E+00
2015	30	3.90E-01	1.71E+00	7.36E+00	1.67E-02	7.19E-02	3.60E-02	6.17E-02	0.00E+00	6.61E-02	3.55E-02	1.74E+03	1.75E-01	1.97E+00
2015	35	3.41E-01	1.67E+00	6.70E+00	1.67E-02	7.43E-02	3.60E-02	6.17E-02	0.00E+00	6.84E-02	3.55E-02	1.65E+03	1.75E-01	1.97E+00
2015	40	2.98E-01	1.66E+00	6.17E+00	1.67E-02	7.97E-02	3.60E-02	6.17E-02	0.00E+00	7.33E-02	3.55E-02	1.57E+03	1.75E-01	1.97E+00
2015	45	2.63E-01	1.68E+00	5.79E+00	1.67E-02	8.80E-02	3.60E-02	6.17E-02	0.00E+00	8.10E-02	3.55E-02	1.52E+03	1.75E-01	1.97E+00
2015	50	2.35E-01	1.73E+00	5.54E+00	1.67E-02	9.93E-02	3.60E-02	6.17E-02	0.00E+00	9.14E-02	3.55E-02	1.48E+03	1.75E-01	1.97E+00
2015	55	2.15E-01	1.82E+00	5.44E+00	1.67E-02	1.14E-01	3.60E-02	6.17E-02	0.00E+00	1.05E-01	3.55E-02	1.46E+03	1.75E-01	1.97E+00
2016	Idle	4.53E+00	1.66E+01	2.79E+01	4.06E-02	5.76E-02	0.00E+00	0.00E+00	0.00E+00	5.30E-02	0.00E+00	4.50E+03	8.75E-01	9.83E+00
2016	5	4.23E+00	1.01E+01	2.16E+01	1.67E-02	1.07E-01	3.60E-02	6.17E-02	0.00E+00	9.80E-02	3.55E-02	3.72E+03	1.75E-01	1.97E+00
2016	10	2.46E+00	6.30E+00	1.63E+01	1.67E-02	9.77E-02	3.60E-02	6.17E-02	0.00E+00	8.99E-02	3.55E-02	3.07E+03	1.75E-01	1.97E+00
2016	15	1.25E+00	3.66E+00	1.22E+01	1.67E-02	8.92E-02	3.60E-02	6.17E-02	0.00E+00	8.21E-02	3.55E-02	2.52E+03	1.75E-01	1.97E+00
2016	20	5.37E-01	1.98E+00	9.25E+00	1.67E-02	8.01E-02	3.60E-02	6.17E-02	0.00E+00	7.37E-02	3.55E-02	1.99E+03	1.75E-01	1.97E+00
2016	25	4.69E-01	1.87E+00	8.29E+00	1.67E-02	7.65E-02	3.60E-02	6.17E-02	0.00E+00	7.04E-02	3.55E-02	1.86E+03	1.75E-01	1.97E+00
2016	30	4.09E-01	1.79E+00	7.48E+00	1.67E-02	7.59E-02	3.60E-02	6.17E-02	0.00E+00	6.98E-02	3.55E-02	1.74E+03	1.75E-01	1.97E+00
2016	35	3.57E-01	1.75E+00	6.80E+00	1.67E-02	7.85E-02	3.60E-02	6.17E-02	0.00E+00	7.22E-02	3.55E-02	1.65E+03	1.75E-01	1.97E+00
2016	40	3.13E-01	1.74E+00	6.27E+00	1.67E-02	8.42E-02	3.60E-02	6.17E-02	0.00E+00	7.75E-02	3.55E-02	1.57E+03	1.75E-01	1.97E+00
2016	45	2.76E-01	1.76E+00	5.88E+00	1.67E-02	9.30E-02	3.60E-02	6.17E-02	0.00E+00	8.56E-02	3.55E-02	1.52E+03	1.75E-01	1.97E+00
2016	50	2.47E-01	1.82E+00	5.63E+00	1.67E-02	1.05E-01	3.60E-02	6.17E-02	0.00E+00	9.65E-02	3.55E-02	1.48E+03	1.75E-01	1.97E+00
2016	55	2.26E-01	1.90E+00	5.52E+00	1.67E-02	1.20E-01	3.60E-02	6.17E-02	0.00E+00	1.10E-01	3.55E-02	1.46E+03	1.75E-01	1.97E+00
2017	Idle	4.53E+00	1.66E+01	2.79E+01	4.07E-02	5.76E-02	0.00E+00	0.00E+00	0.00E+00	5.30E-02	0.00E+00	4.50E+03	8.75E-01	9.83E+00
2017	5	4.36E+00	1.04E+01	2.16E+01	1.67E-02	1.11E-01	3.60E-02	6.17E-02	0.00E+00	1.03E-01	3.55E-02	3.71E+03	1.75E-01	1.97E+00
2017	10	2.54E+00	6.50E+00	1.63E+01	1.67E-02	1.02E-01	3.60E-02	6.17E-02	0.00E+00	9.39E-02	3.55E-02	3.07E+03	1.75E-01	1.97E+00
2017	15	1.29E+00	3.77E+00	1.22E+01	1.67E-02	9.32E-02	3.60E-02	6.17E-02	0.00E+00	8.57E-02	3.55E-02	2.52E+03	1.75E-01	1.97E+00
2017	20	5.54E-01	2.05E+00	9.25E+00	1.67E-02	8.37E-02	3.60E-02	6.17E-02	0.00E+00	7.70E-02	3.55E-02	1.99E+03	1.75E-01	1.97E+00
2017	25	4.84E-01	1.93E+00	8.29E+00	1.67E-02	7.99E-02	3.60E-02	6.17E-02	0.00E+00	7.35E-02	3.55E-02	1.85E+03	1.75E-01	1.97E+00
2017	30	4.22E-01	1.85E+00	7.48E+00	1.67E-02	7.94E-02	3.60E-02	6.17E-02	0.00E+00	7.30E-02	3.55E-02	1.74E+03	1.75E-01	1.97E+00
2017	35	3.68E-01	1.80E+00	6.80E+00	1.67E-02	8.21E-02	3.60E-02	6.17E-02	0.00E+00	7.55E-02	3.55E-02	1.65E+03	1.75E-01	1.97E+00
2017	40	3.23E-01	1.79E+00	6.27E+00	1.67E-02	8.80E-02	3.60E-02	6.17E-02	0.00E+00	8.10E-02	3.55E-02	1.57E+03	1.75E-01	1.97E+00
2017	45	2.85E-01	1.82E+00	5.88E+00	1.67E-02	9.72E-02	3.60E-02	6.17E-02	0.00E+00	8.94E-02	3.55E-02	1.52E+03	1.75E-01	1.97E+00
2017	50	2.55E-01	1.87E+00	5.63E+00	1.67E-02	1.10E-01	3.60E-02	6.17E-02	0.00E+00	1.01E-01	3.55E-02	1.48E+03	1.75E-01	1.97E+00
2017	55	2.33E-01	1.97E+00	5.52E+00	1.67E-02	1.25E-01	3.60E-02	6.17E-02	0.00E+00	1.15E-01	3.55E-02	1.46E+03	1.75E-01	1.97E+00
2020	Idle	4.53E+00	1.66E+01	2.79E+01	4.09E-02	5.76E-02	0.00E+00	0.00E+00	0.00E+00	5.30E-02	0.00E+00	4.50E+03	8.75E-01	9.83E+00
2020	5	4.28E+00	1.02E+01	1.96E+01	1.66E-02	1.18E-01	3.60E-02	6.17E-02	0.00E+00	1.08E-01	3.55E-02	3.69E+03	1.75E-01	1.97E+00
2020	10	2.49E+00	6.38E+00	1.47E+01	1.66E-02	1.08E-01	3.60E-02	6.17E-02	0.00E+00	9.91E-02	3.55E-02	3.05E+03	1.75E-01	1.97E+00
2020	15	1.26E+00	3.70E+00	1.11E+01	1.66E-02	9.83E-02	3.60E-02	6.17E-02	0.00E+00	9.04E-02	3.55E-02	2.50E+03	1.75E-01	1.97E+00
2020	20	5.44E-01	2.01E+00	8.36E+00	1.66E-02	8.83E-02	3.60E-02	6.17E-02	0.00E+00	8.12E-02	3.55E-02	1.97E+03	1.75E-01	1.97E+00
2020	25	4.75E-01	1.89E+00	7.50E+00	1.66E-02	8.43E-02	3.60E-02	6.17E-02	0.00E+00	7.76E-02	3.55E-02	1.84E+03	1.75E-01	1.97E+00
2020	30	4.14E-01	1.82E+00	6.76E+00	1.66E-02	8.37E-02	3.60E-02	6.17E-02	0.00E+00	7.70E-02	3.55E-02	1.73E+03	1.75E-01	1.97E+00
2020	35	3.61E-01	1.77E+00	6.15E+00	1.66E-02	8.66E-02	3.60E-02	6.17E-02	0.00E+00	7.97E-02	3.55E-02	1.64E+03	1.75E-01	1.97E+00
2020	40	3.16E-01	1.76E+00	5.67E+00	1.66E-02	9.28E-02	3.60E-02	6.17E-02	0.00E+00	8.54E-02	3.55E-02	1.56E+03	1.75E-01	1.97E+00
2020	45	2.79E-01	1.78E+00	5.32E+00	1.66E-02	1.03E-01	3.60E-02	6.17E-02	0.00E+00	9.44E-02	3.55E-02	1.51E+03	1.75E-01	1.97E+00
2020	50	2.50E-01	1.84E+00	5.09E+00	1.66E-02	1.16E-01	3.60E-02	6.17E-02	0.00E+00	1.06E-01	3.55E-02	1.47E+03	1.75E-01	1.97E+00
2020	55	2.28E-01	1.93E+00	4.99E+00	1.66E-02	1.32E-01	3.60E-02	6.17E-02	0.00E+00	1.22E-01	3.55E-02	1.45E+03	1.75E-01	1.97E+00
2026	Idle	4.53E+00	1.66E+01	2.79E+01	4.09E-02	5.76E-02	0.00E+00	0.00E+00	0.00E+00	5.30E-02	0.00E+00	4.50E+03	8.75E-01	9.83E+00
2026	5	2.76E+00	6.63E+00	9.45E+00	1.66E-02	1.05E-01	3.60E-02	6.17E-02	0.00E+00	9.66E-02	3.55E-02	3.61E+03	1.75E-01	1.97E+00
2026	10	1.61E+00	4.13E+00	7.11E+00	1.66E-02	9.63E-02	3.60E-02	6.17E-02	0.00E+00	8.86E-02	3.55E-02	2.98E+03	1.75E-01	1.97E+00
2026	15	8.17E-01	2.40E+00	5.35E+00	1.66E-02	8.79E-02	3.60E-02	6.17E-02	0.00E+00	8.09E-02	3.55E-02	2.45E+03	1.75E-01	1.97E+00
2026	20	3.51E-01	1.30E+00	4.04E+00	1.66E-02	7.89E-02	3.60E-02	6.17E-02	0.00E+00	7.26E-02	3.55E-02	1.93E+03	1.75E-01	1.97E+00
2026	25	3.07E-01	1.23E+00	3.62E+00	1.66E-02	7.53E-02	3.60E-02	6.17E-02	0.00E+00	6.93E-02	3.55E-02	1.80E+03	1.75E-01	1.97E+00
2026	30	2.67E-01	1.18E+00	3.27E+00	1.66E-02	7.48E-02	3.60E-02	6.17E-02	0.00E+00	6.88E-02	3.55E-02	1.69E+03	1.75E-01	1.97E+00
2026	35	2.33E-01	1.15E+00	2.97E+00	1.66E-02	7.73E-02	3.60E-02	6.17E-02	0.00E+00	7.11E-02	3.55E-02	1.60E+03	1.75E-01	1.97E+00
2026	40	2.04E-01	1.14E+00	2.74E+00	1.66E-02	8.30E-02	3.60E-02	6.17E-02	0.00E+00	7.64E-02	3.55E-02	1.53E+03	1.75E-01	1.97E+00
2026	45	1.80E-01	1.15E+00	2.57E+00	1.66E-02	9.16E-02	3.60E-02	6.17E-02	0.00E+00	8.43E-02	3.55E-02	1.47E+03	1.75E-01	1.97E+00
2026	50	1.61E-01	1.19E+00	2.46E+00	1.66E-02	1.03E-01	3.60E-02	6.17E-02	0.00E+00	9.51E-02	3.55E-02	1.44E+03	1.75E-01	1.97E+00
2026	55	1.47E-01	1.25E+00	2.41E+00	1.66E-02	1.18E-01	3.60E-02	6.17E-02	0.00E+00	1.09E-01	3.55E-02	1.42E+03	1.75E-01	1.97E+00

Notes:

1. Emission factors for trucks using LNG are assumed to be the same as diesel trucks except for DPM (set to zero) and GHG.
2. The CO2 emission factor for LNG drayage trucks was derived from the emission factor for diesel drayage trucks by (a) scaling by the ratio of CO2 emission factors per gallon of fuel for diesel and LNG (from the 2012 Climate Registry Default Emission Factors, Table 13.1), and (b) scaling by the ratio of fuel consumed by conserving fuel heat content and applying a 15% thermal efficiency penalty to LNG (National Renewable Energy Laboratory, July 1999. "Using LNG as a Fuel in Heavy-Duty Tractors". NREL/SR-540-24146. Page 3).
3. N2O and CH4 emission factors are from the 2012 Climate Registry Default Emission Factors (The Climate Registry, 1/6/2012), Table 13.6.

Table B1.62 Emission Factors for Automobiles

		Emission Factors (g/mi) or (g/hr) for idle												
Analysis Year	Speed (mph)	VOC	CO	NOx	SOx	PM10 Exhaust	PM10 Tire Wear	PM10 Brake Wear	DPM	PM2.5 Exhaust	PM2.5 Tire & Brake Wear	CO2	N2O	CH4
2012	Idle	1.92E+00	2.41E+01	2.09E+00	2.29E-02	8.27E-02	0.00E+00	0.00E+00	1.93E-03	7.56E-02	0.00E+00	6.23E+03	3.63E-01	6.09E-01
2012	5	3.85E-01	4.82E+00	4.19E-01	4.58E-03	1.65E-02	8.00E-03	3.67E-02	3.85E-04	1.51E-02	1.77E-02	1.25E+03	7.26E-02	1.22E-01
2012	10	2.60E-01	4.04E+00	3.60E-01	4.58E-03	1.08E-02	8.00E-03	3.67E-02	3.40E-04	9.87E-03	1.77E-02	9.26E+02	7.26E-02	1.22E-01
2012	15	1.84E-01	3.48E+00	3.18E-01	4.58E-03	7.41E-03	8.00E-03	3.67E-02	2.70E-04	6.76E-03	1.77E-02	7.12E+02	7.26E-02	1.22E-01
2012	20	1.36E-01	3.06E+00	2.87E-01	4.58E-03	5.35E-03	8.00E-03	3.67E-02	2.19E-04	4.88E-03	1.77E-02	5.69E+02	7.26E-02	1.22E-01
2012	25	1.06E-01	2.74E+00	2.64E-01	4.58E-03	4.06E-03	8.00E-03	3.67E-02	1.82E-04	3.70E-03	1.77E-02	4.73E+02	7.26E-02	1.22E-01
2012	30	8.64E-02	2.49E+00	2.49E-01	4.58E-03	3.23E-03	8.00E-03	3.67E-02	1.54E-04	2.94E-03	1.77E-02	4.06E+02	7.26E-02	1.22E-01
2012	35	7.43E-02	2.29E+00	2.39E-01	4.58E-03	2.70E-03	8.00E-03	3.67E-02	1.34E-04	2.46E-03	1.77E-02	3.63E+02	7.26E-02	1.22E-01
2012	40	6.71E-02	2.16E+00	2.31E-01	4.58E-03	2.37E-03	8.00E-03	3.67E-02	1.19E-04	2.15E-03	1.77E-02	3.37E+02	7.26E-02	1.22E-01
2012	45	6.34E-02	2.06E+00	2.27E-01	4.58E-03	2.18E-03	8.00E-03	3.67E-02	1.08E-04	1.98E-03	1.77E-02	3.26E+02	7.26E-02	1.22E-01
2012	50	6.31E-02	2.00E+00	2.29E-01	4.58E-03	2.11E-03	8.00E-03	3.67E-02	1.00E-04	1.91E-03	1.77E-02	3.25E+02	7.26E-02	1.22E-01
2012	55	6.60E-02	2.00E+00	2.36E-01	4.58E-03	2.13E-03	8.00E-03	3.67E-02	9.57E-05	1.93E-03	1.77E-02	3.36E+02	7.26E-02	1.22E-01
2012	60	7.31E-02	2.06E+00	2.52E-01	4.58E-03	2.27E-03	8.00E-03	3.67E-02	9.35E-05	2.05E-03	1.77E-02	3.57E+02	7.26E-02	1.22E-01
2012	65	8.47E-02	2.22E+00	2.69E-01	4.58E-03	2.53E-03	8.00E-03	3.67E-02	9.38E-05	2.29E-03	1.77E-02	3.98E+02	7.26E-02	1.22E-01
2015	Idle	1.33E+00	1.74E+01	1.57E+00	2.29E-02	6.48E-02	0.00E+00	0.00E+00	1.19E-03	5.95E-02	0.00E+00	5.74E+03	3.63E-01	6.02E-01
2015	5	2.66E-01	3.48E+00	3.14E-01	4.58E-03	1.30E-02	8.00E-03	3.67E-02	2.38E-04	1.19E-02	1.77E-02	1.15E+03	7.27E-02	1.20E-01
2015	10	1.80E-01	2.97E+00	2.70E-01	4.58E-03	8.40E-03	8.00E-03	3.67E-02	2.09E-04	7.72E-03	1.77E-02	8.52E+02	7.27E-02	1.20E-01
2015	15	1.27E-01	2.58E+00	2.38E-01	4.58E-03	5.73E-03	8.00E-03	3.67E-02	1.66E-04	5.26E-03	1.77E-02	6.56E+02	7.27E-02	1.20E-01
2015	20	9.33E-02	2.29E+00	2.14E-01	4.58E-03	4.11E-03	8.00E-03	3.67E-02	1.34E-04	3.77E-03	1.77E-02	5.25E+02	7.27E-02	1.20E-01
2015	25	7.25E-02	2.06E+00	1.97E-01	4.58E-03	3.10E-03	8.00E-03	3.67E-02	1.11E-04	2.85E-03	1.77E-02	4.35E+02	7.27E-02	1.20E-01
2015	30	5.92E-02	1.88E+00	1.85E-01	4.58E-03	2.46E-03	8.00E-03	3.67E-02	9.46E-05	2.26E-03	1.77E-02	3.74E+02	7.27E-02	1.20E-01
2015	35	5.09E-02	1.73E+00	1.77E-01	4.58E-03	2.05E-03	8.00E-03	3.67E-02	8.23E-05	1.88E-03	1.77E-02	3.34E+02	7.27E-02	1.20E-01
2015	40	4.60E-02	1.63E+00	1.70E-01	4.58E-03	1.80E-03	8.00E-03	3.67E-02	7.34E-05	1.64E-03	1.77E-02	3.11E+02	7.27E-02	1.20E-01
2015	45	4.37E-02	1.55E+00	1.67E-01	4.58E-03	1.65E-03	8.00E-03	3.67E-02	6.71E-05	1.51E-03	1.77E-02	3.00E+02	7.27E-02	1.20E-01
2015	50	4.36E-02	1.50E+00	1.68E-01	4.58E-03	1.59E-03	8.00E-03	3.67E-02	6.29E-05	1.46E-03	1.77E-02	3.00E+02	7.27E-02	1.20E-01
2015	55	4.59E-02	1.48E+00	1.73E-01	4.58E-03	1.62E-03	8.00E-03	3.67E-02	6.06E-05	1.48E-03	1.77E-02	3.09E+02	7.27E-02	1.20E-01
2015	60	5.10E-02	1.50E+00	1.85E-01	4.58E-03	1.72E-03	8.00E-03	3.67E-02	6.01E-05	1.57E-03	1.77E-02	3.29E+02	7.27E-02	1.20E-01
2015	65	5.95E-02	1.59E+00	1.97E-01	4.58E-03	1.93E-03	8.00E-03	3.67E-02	6.15E-05	1.76E-03	1.77E-02	3.66E+02	7.27E-02	1.20E-01
2016	Idle	1.18E+00	1.57E+01	1.44E+00	2.29E-02	6.23E-02	0.00E+00	0.00E+00	1.00E-03	5.74E-02	0.00E+00	5.55E+03	3.63E-01	6.02E-01
2016	5	2.36E-01	3.13E+00	2.87E-01	4.58E-03	1.25E-02	8.00E-03	3.67E-02	2.01E-04	1.15E-02	1.77E-02	1.11E+03	7.27E-02	1.20E-01
2016	10	1.60E-01	2.69E+00	2.47E-01	4.58E-03	8.06E-03	8.00E-03	3.67E-02	1.77E-04	7.42E-03	1.77E-02	8.25E+02	7.27E-02	1.20E-01
2016	15	1.12E-01	2.35E+00	2.17E-01	4.58E-03	5.48E-03	8.00E-03	3.67E-02	1.40E-04	5.04E-03	1.77E-02	6.35E+02	7.27E-02	1.20E-01
2016	20	8.27E-02	2.09E+00	1.95E-01	4.58E-03	3.93E-03	8.00E-03	3.67E-02	1.13E-04	3.61E-03	1.77E-02	5.08E+02	7.27E-02	1.20E-01
2016	25	6.42E-02	1.89E+00	1.79E-01	4.58E-03	2.96E-03	8.00E-03	3.67E-02	9.39E-05	2.72E-03	1.77E-02	4.21E+02	7.27E-02	1.20E-01
2016	30	5.24E-02	1.72E+00	1.68E-01	4.58E-03	2.34E-03	8.00E-03	3.67E-02	7.99E-05	2.15E-03	1.77E-02	3.62E+02	7.27E-02	1.20E-01
2016	35	4.51E-02	1.59E+00	1.61E-01	4.58E-03	1.95E-03	8.00E-03	3.67E-02	6.96E-05	1.79E-03	1.77E-02	3.23E+02	7.27E-02	1.20E-01
2016	40	4.08E-02	1.49E+00	1.55E-01	4.58E-03	1.71E-03	8.00E-03	3.67E-02	6.21E-05	1.57E-03	1.77E-02	3.01E+02	7.27E-02	1.20E-01
2016	45	3.88E-02	1.42E+00	1.52E-01	4.58E-03	1.57E-03	8.00E-03	3.67E-02	5.69E-05	1.44E-03	1.77E-02	2.90E+02	7.27E-02	1.20E-01
2016	50	3.88E-02	1.37E+00	1.52E-01	4.58E-03	1.51E-03	8.00E-03	3.67E-02	5.35E-05	1.39E-03	1.77E-02	2.90E+02	7.27E-02	1.20E-01
2016	55	4.09E-02	1.34E+00	1.57E-01	4.58E-03	1.53E-03	8.00E-03	3.67E-02	5.18E-05	1.40E-03	1.77E-02	2.99E+02	7.27E-02	1.20E-01
2016	60	4.55E-02	1.35E+00	1.67E-01	4.58E-03	1.63E-03	8.00E-03	3.67E-02	5.18E-05	1.50E-03	1.77E-02	3.18E+02	7.27E-02	1.20E-01
2016	65	5.32E-02	1.43E+00	1.78E-01	4.58E-03	1.83E-03	8.00E-03	3.67E-02	5.35E-05	1.68E-03	1.77E-02	3.55E+02	7.27E-02	1.20E-01
2017	Idle	1.04E+00	1.40E+01	1.32E+00	2.29E-02	6.09E-02	0.00E+00	0.00E+00	8.46E-04	5.63E-02	0.00E+00	5.35E+03	3.63E-01	6.02E-01
2017	5	2.08E-01	2.81E+00	2.63E-01	4.58E-03	1.22E-02	8.00E-03	3.67E-02	1.69E-04	1.13E-02	1.77E-02	1.07E+03	7.27E-02	1.20E-01
2017	10	1.41E-01	2.43E+00	2.26E-01	4.58E-03	7.85E-03	8.00E-03	3.67E-02	1.49E-04	7.25E-03	1.77E-02	7.94E+02	7.27E-02	1.20E-01
2017	15	9.87E-02	2.13E+00	1.99E-01	4.58E-03	5.32E-03	8.00E-03	3.67E-02	1.18E-04	4.91E-03	1.77E-02	6.12E+02	7.27E-02	1.20E-01
2017	20	7.26E-02	1.90E+00	1.79E-01	4.58E-03	3.80E-03	8.00E-03	3.67E-02	9.52E-05	3.51E-03	1.77E-02	4.89E+02	7.27E-02	1.20E-01
2017	25	5.63E-02	1.72E+00	1.64E-01	4.58E-03	2.86E-03	8.00E-03	3.67E-02	7.90E-05	2.63E-03	1.77E-02	4.06E+02	7.27E-02	1.20E-01
2017	30	4.59E-02	1.57E+00	1.53E-01	4.58E-03	2.26E-03	8.00E-03	3.67E-02	6.72E-05	2.08E-03	1.77E-02	3.49E+02	7.27E-02	1.20E-01
2017	35	3.95E-02	1.45E+00	1.46E-01	4.58E-03	1.88E-03	8.00E-03	3.67E-02	5.86E-05	1.73E-03	1.77E-02	3.11E+02	7.27E-02	1.20E-01
2017	40	3.58E-02	1.36E+00	1.41E-01	4.58E-03	1.64E-03	8.00E-03	3.67E-02	5.25E-05	1.51E-03	1.77E-02	2.90E+02	7.27E-02	1.20E-01
2017	45	3.41E-02	1.30E+00	1.38E-01	4.58E-03	1.51E-03	8.00E-03	3.67E-02	4.82E-05	1.39E-03	1.77E-02	2.79E+02	7.27E-02	1.20E-01
2017	50	3.42E-02	1.25E+00	1.38E-01	4.58E-03	1.45E-03	8.00E-03	3.67E-02	4.56E-05	1.34E-03	1.77E-02	2.79E+02	7.27E-02	1.20E-01
2017	55	3.60E-02	1.22E+00	1.42E-01	4.58E-03	1.47E-03	8.00E-03	3.67E-02	4.44E-05	1.35E-03	1.77E-02	2.88E+02	7.27E-02	1.20E-01
2017	60	4.01E-02	1.22E+00	1.52E-01	4.58E-03	1.57E-03	8.00E-03	3.67E-02	4.47E-05	1.44E-03	1.77E-02	3.07E+02	7.27E-02	1.20E-01
2017	65	4.71E-02	1.28E+00	1.61E-01	4.58E-03	1.76E-03	8.00E-03	3.67E-02	4.67E-05	1.62E-03	1.77E-02	3.42E+02	7.27E-02	1.20E-01
2020	Idle	7.67E-01	1.06E+01	1.05E+00	2.28E-02	6.06E-02	0.00E+00	0.00E+00	5.34E-04	5.62E-02	0.00E+00	4.78E+03	3.64E-01	6.02E-01
2020	5	1.53E-01	2.13E+00	2.10E-01	4.56E-03	1.21E-02	8.00E-03	3.67E-02	1.07E-04	1.12E-02	1.77E-02	9.56E+02	7.27E-02	1.20E-01
2020	10	1.04E-01	1.88E+00	1.80E-01	4.56E-03	7.74E-03	8.00E-03	3.67E-02	9.38E-05	7.18E-03	1.77E-02	7.10E+02	7.27E-02	1.20E-01
2020	15	7.23E-02	1.67E+00	1.58E-01	4.56E-03	5.21E-03	8.00E-03	3.67E-02	7.37E-05	4.83E-03	1.77E-02	5.47E+02	7.27E-02	1.20E-01
2020	20	5.30E-02	1.51E+00	1.42E-01	4.56E-03	3.70E-03	8.00E-03	3.67E-02	5.96E-05	3.43E-03	1.77E-02	4.37E+02	7.27E-02	1.20E-01
2020	25	4.10E-02	1.37E+00	1.29E-01	4.56E-03	2.76E-03	8.00E-03	3.67E-02	4.95E-05	2.56E-03	1.77E-02	3.62E+02	7.27E-02	1.20E-01
2020	30	3.34E-02	1.25E+00	1.21E-01	4.56E-03	2.17E-03	8.00E-03	3.67E-02	4.22E-05	2.01E-03	1.77E-02	3.12E+02	7.27E-02	1.20E-01
2020	35	2.88E-02	1.16E+00	1.15E-01	4.56E-03	1.80E-03	8.00E-03	3.67E-02	3.70E-05	1.67E-03	1.77E-02	2.78E+02	7.27E-02	1.20E-01
2020	40	2.62E-02	1.09E+00	1.10E-01	4.56E-03	1.57E-03	8.00E-03	3.67E-02	3.34E-05	1.45E-03	1.77E-02	2.59E+02	7.27E-02	1.20E-01
2020	45	2.51E-02	1.03E+00	1.07E-01	4.56E-03	1.44E-03	8.00E-03	3.67E-02	3.11E-05	1.33E-03	1.77E-02	2.50E+02	7.27E-02	1.20E-01
2020	50	2.53E-02	9.83E-01	1.07E-01	4.56E-03	1.38E-03	8.00E-03	3.67E-02	2.99E-05	1.28E-03	1.77E-02	2.49E+02	7.27E-02	1.20E-01
2020	55	2.68E-02	9.52E-01	1.10E-01	4.56E-03	1.40E-03	8.00E-03	3.67E-02	2.97E-05	1.30E-03	1.77E-02	2.58E+02	7.27E-02	1.20E-01
2020	60	3.00E-02	9.36E-01	1.17E-01	4.56E-03	1.50E-03	8.00E-03	3.67E-02	3.08E-05	1.39E-03	1.77E-02	2.74E+02	7.27E-02	1.20E-01
2020	65	3.56E-02	9.65E-01	1.25E-01	4.56E-03	1.69E-03	8.00E-03	3.67E-02	3.34E-05	1.56E-03	1.77E-02	3.05E+02	7.27E-02	1.20E-01
2026	Idle	5.81E-01	7.76E+00	7.87E-01	2.31E-02	6.50E-02	0.00E+00	0.00E+00	2.34E-04	6.03E-02	0.00E+00	4.42E+03	3.64E-01	6.10E-01
2026	5	1.16E-01	1.55E+00	1.57E-01	4.61E-03	1.30E-02	8.00E-03	3.67E-02	4.68E-05	1.21E-02	1.77E-02	8.84E+02	7.29E-02	1.22E-01
2026	10	7.90E-02	1.40E+00	1.35E-01	4.61E-03	8.23E-03	8.00E-03	3.67E-02	4.06E-05	7.63E-03	1.77E-02	6.57E+02	7.29E-02	1.22E-01
2026	15	5.50E-02	1.27E+00	1.19E-01	4.61E-03	5.49E-03	8.00E-03	3.67E-02	3.14E-05	5.09E-03	1.77E-02	5.05E+02	7.29E-02	1.22E-01
2026	20	4.03E-02	1.15E+00	1.06E-01	4.61E-03	3.86E-03	8.00E-03	3.67E-02	2.52E-05	3.58E-03	1.77E-02	4.04E+02	7.29E-02	1.22E-01
2026	25	3.13E-02	1.05E+00	9.71E-02	4.61E-03	2.87E-03	8.00E-03	3.67E-02	2.10E-05	2.66E-03	1.77E-02	3.35E+02	7.29E-02	1.22E-01
2026	30	2.56E-02	9.69E-01	9.04E-02	4.61E-03	2.24E-03	8.00E-03	3.67E-02	1.81E-05	2.08E-03	1.77E-02	2.88E+02	7.29E-02	1.22E-01
2026	35	2.22E-02	8.96E-01	8.58E-02	4.61E-03	1.85E-03	8.00E-03	3.67E-02	1.62E-05	1.71E-03	1.77E-02	2.57E+02	7.29E-02	1.22E-01
2026	40	2.03E-02	8.40E-01	8.20E-02	4.61E-03	1.60E-03	8.00E-03	3.67E-02	1.50E-05	1.49E-03	1.77E-02	2.39E+02	7.29E-02	1.22E-01
2026	45	1.97E-02	7.94E-01	7.99E-02	4.61E-03	1.47E-03	8.00E-03	3.67E-02	1.45E-05	1.36E-03	1.77E-02	2.31E+02	7.29E-02	1.22E-01
2026	50	2.01E-02	7.56E-01	7.95E-02	4.61E-03	1.42E-03	8.00E-03	3.67E-02	1.47E-05	1.31E-03	1.77E-02	2.31E+02	7.29E-02	1.22E-01
2026	55	2.16E-02	7.25E-01	8.17E-02	4.61E-03	1.44E-03	8.00E-03	3.67E-02	1.56E-05	1.34E-03	1.77E-02	2.38E+02	7.29E-02	1.22E-01
2026	60	2.45E-02	7.08E-01	8.64E-02	4.61E-03	1.54E-03	8.00E-03	3.67E-02	1.74E-05	1.43E-03	1.77E-02	2.53E+02	7.29E-02	1.22E-01
2026	65	2.95E-02	7.23E-01	9.16E-02	4.61E-03	1.74E-03	8.00E-03	3.67E-02	2.06E-05	1.62E-03	1.77E-02	2.82E+02	7.29E-02	1.22E-01

Notes:

1. Criteria pollutant and CO2 emission factors are from EMFAC2011.
2. Idle emission factors were derived from the running exhaust emission factors at 5 mph, in accordance with EMFAC2011 guidance.
3. EMFAC2011 vehicle categories for the emission factors include Passenger Cars, Light Duty Trucks, Medium Duty Trucks, and Motorcycles.
4. CO2 emission factors include the Pavley and LCFS regulations.
5. CH4 and N2O emission factors are from the 2012 Climate Registry Default Emission Factors (The Climate Registry, 1/6/2012). Tables 13.4 (Motorcycles) and 13.5 (all other vehicles). For each vehicle category, the oldest model year range was conservatively selected.

Table B1.63 Paved Road Dust Emission Factor Derivation

Emission Source	(sL) Silt Loading (g/m2)	(k) Particle Size Multiplier - PM10 (g/VMT)	(k) Particle Size Multiplier - PM2.5 (g/VMT)	(W) Average Vehicle Weight on Road (tons)	(E) Uncontrolled PM10 Emission Factor (g/VMT)	(E) Uncontrolled PM2.5 Emission Factor (g/VMT)
Onsite Drayage Trucks	0.6	1.00	0.25	18.9	12.59	3.15
Onsite Autos	0.6	1.00	0.25	2.4	1.53	0.38
Offsite Roadway (all vehicles) <500 ADT	0.6	1.00	0.25	2.4	1.53	0.38
Offsite Roadway (all vehicles) 500-5000 ADT	0.2	1.00	0.25	2.4	0.56	0.14
Offsite Roadway (all vehicles) 5000-10000 ADT	0.06	1.00	0.25	2.4	0.19	0.05
Offsite Roadway (all vehicles) >10000 ADT	0.03	1.00	0.25	2.4	0.10	0.03
Offsite Roadway (all vehicles) >10000 ADT Limited Access	0.015	1.00	0.25	2.4	0.05	0.01

Notes:

1. Emission factors are calculated using Equation 1 of AP-42 Section 13.2.1 (Jan 2011). Because the emissions are primarily used for peak day or peak hour calculations, the downward adjustment due to annual precipitation (in Equation 2) was not made.
2. Emission factors exclude engine exhaust, tire wear, and brake wear.
3. The equation is: E = k (sL)^0.91 x (W)^1.02

Table B1.64 Annualization Factors for YTI Truck Trips

Year	Percent of YTI Activity on Weekdays	Average-to-Peak Month Factor	Annualization Factor
2012	12.24%	1.0061	294.5
2015	--	--	282.2
2016	--	--	278.2
2017	15.00%	1.116	274.1
2020	15.00%	1.116	274.1
2026	15.00%	1.116	274.1

Notes:

1. Annualization factors are multiplied by the peak day trips to obtain annual trips.
2. Annualization factors are computed by converting peak month to average month, accounting for weekend/weekday split, and then expanding to 5*52 weekdays in a year.
3. Years 2015 and 2016 were interpolated.
4. Source: Cambridge Systematics, personal communication from Sean McAtee, 7/29/2013.

Table B1.65 **Conformity Analysis Emissions Without Mitigation - Proposed Project (tons/year)**

	PM10	PM2.5	NOX	SOX	CO	VOC
2015						
Sheet Piling 1	0.1	0.1	3.8	0.0	2.1	0.3
Sheet Piling 2	0.1	0.1	3.8	0.0	2.1	0.3
Dredging - Maximum of Ocean Disposal and Upland Disposal	0.3	0.2	7.4	0.0	0.7	0.1
Crane Rail Extension	0.1	0.1	1.4	0.0	0.7	0.1
2 LAHD Crane Relocation (B217-220)	0.0	0.0	0.9	0.0	0.5	0.1
2 YTI Crane Relocation/Realignment (B217-220)	0.0	0.0	0.3	0.0	0.1	0.0
4 New YTI Crane Delivery (B217-220)	0.0	0.0	1.3	0.1	0.2	0.0
6 Crane Height Raising and Boom Extension (4 cranes at B212-213, 2 cranes at B217-220)	0.1	0.1	1.4	0.0	1.0	0.1
Total 2015	**0.8**	**0.6**	**20.3**	**0.1**	**7.3**	**1.0**
De Minimis Level	100.0	100.0	10.0	100.0	100.0	10.0
Exceeds de minimis?	No	No	Yes	No	No	No
2016						
Sheet and King Pile Installation 1	0.2	0.2	5.7	0.0	3.5	0.4
Sheet and King Pile Installation 2	0.2	0.2	5.3	0.0	3.0	0.4
Dredging - Maximum of Ocean Disposal and Upland Disposal	0.3	0.2	7.4	0.0	1.0	0.1
Total 2016	**0.7**	**0.6**	**18.5**	**0.0**	**7.5**	**1.0**
De Minimis Level	100.0	100.0	10.0	100.0	100.0	10.0
Exceeds de minimis?	No	No	Yes	No	No	No

Notes:

Only those construction elements that would result due to the federal action are included in the conformity analysis. The USACE has authority over mobile and stationary sources while they are on-site or at berth, but no authority over mobile sources while they are in transit to/from the site (E-mail communication with Theresa Stevens, USACE. March 17, 2014).

Table B1.66 **Conformity Analysis Emissions With Mitigation - Proposed Project (tons/year)**

	PM10	PM2.5	NOX	SOX	CO	VOC
2015						
Sheet Piling 1	0.0	0.0	2.0	0.0	1.2	0.2
Sheet Piling 2	0.0	0.0	1.9	0.0	1.2	0.2
Dredging - Maximum of Ocean Disposal and Upland Disposal	0.1	0.1	2.3	0.0	1.4	0.2
Crane Rail Extension	0.0	0.0	0.7	0.0	0.6	0.1
2 LAHD Crane Relocation (B217-220)	0.0	0.0	0.5	0.0	0.3	0.0
2 YTI Crane Relocation/Realignment (B217-220)	0.0	0.0	0.1	0.0	0.1	0.0
4 New YTI Crane Delivery (B217-220)	0.0	0.0	1.2	0.1	0.2	0.0
6 Crane Height Raising and Boom Extension (4 cranes at B212-213, 2 cranes at B217-220)	0.0	0.0	0.7	0.0	0.7	0.1
Total 2015	**0.3**	**0.2**	**9.4**	**0.1**	**5.7**	**0.8**
De Minimis Level	70.0	100.0	10.0	100.0	100.0	10.0
Exceeds de minimis?	No	No	No	No	No	No
2016						
Sheet and King Pile Installation 1	0.1	0.1	3.0	0.0	2.0	0.3
Sheet and King Pile Installation 2	0.1	0.1	2.8	0.0	1.7	0.2
Dredging - Maximum of Ocean Disposal and Upland Disposal	0.4	0.2	3.9	0.0	2.0	0.2
Total 2016	**0.5**	**0.3**	**9.6**	**0.0**	**5.7**	**0.7**
De Minimis Level	70.0	100.0	10.0	100.0	100.0	10.0
Exceeds de minimis?	No	No	No	No	No	No

Notes:

Only those construction elements that would result due to the federal action are included in the conformity analysis. The USACE has authority over mobile and stationary sources while they are on-site or at berth, but no authority over mobile sources while they are in transit to/from the site (E-mail communication with Theresa Stevens, USACE. March 17, 2014).

Appendix B2
Dispersion Modeling

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Attachments

B2.1 CO Hot Spots CAL3QHC Model Output
B2.2 Wind Rose

1.0 Introduction

This appendix describes the methods and results of air dispersion modeling that predict the ground-level concentrations of criteria pollutants from construction and operation of the Berths 212-224 (YTI) Container Terminal.

The air dispersion modeling methodology was based on Los Angeles Harbor District's (LAHD) Draft Criteria Pollutant Dispersion Modeling Protocol (LAHD 2012) and performed using the U.S. Environmental Protection Agency's (USEPA) AERMOD Modeling system, version 12345, based on the Guideline on Air Quality Models (40 Code of Federal Regulation [CFR], Part 51, Appendix W, November 2005). Nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), particulate matter equal or less than 10 microns in diameter (PM_{10}), and particulate matter equal or less than 2.5microns in diameter ($PM_{2.5}$), were modeled for the proposed Project, CEQA baseline, NEPA baseline, and project alternatives. The predicted ground-level concentrations were compared to the relevant South Coast Air Quality Management District (SCAQMD) air quality significance thresholds to determine ambient air quality impacts.

2.0 Development of Emission Scenarios Used in the Air Dispersion Modeling

2.1 Construction Emission Sources

Construction activities would use the following equipment:

- Offroad construction equipment: land-based equipment and marine-based equipment (dredging and pile driving equipment);
- On-road construction vehicles (haul trucks, delivery trucks);
- Crane delivery ship; and
- Harbor craft: tugboats (used to position dredging barges and scows) and dive boats.

In accordance with SCAQMD guidance, only onsite construction emission sources were modeled for criteria pollutant impacts (SCAQMD 2005). Onsite emission sources included diesel engine exhaust from construction equipment, haul trucks while onsite, crane delivery ship auxiliary engines and boilers while hoteling at berth, and harbor craft used in dredging and pile driving; and fugitive dust. Both unmitigated and mitigated construction emissions were modeled.

2.2 Construction Emissions

To ensure the capture of maximum ambient pollutant concentrations in AERMOD, peak emissions during the 2015-2016 construction period were conservatively modeled for each emission source category, even if the peak emissions would occur during different combinations of overlapping construction phases. The emission source categories were diesel engine exhaust and fugitive dust. Table 2-1 through Table 2-7 present a summary of construction emissions used in the air dispersion modeling for the NEPA baseline, proposed Project without and with

mitigation, Alternative 2 (No Federal Action) without and with mitigation, and Alternative 3 (Reduced Project) without and with mitigation. The CEQA baseline and Alternative 1 (No Project) have no construction emissions and therefore are not presented. The modeled construction emissions differ from the construction emissions summarized in Section 3.2 of the EIS/EIR because (1) the dispersion modeling domain is smaller than the South Coast Air Basin (SCAB), and (2) as described above, the modeled emissions are a combination of peak emissions over multiple analysis years.

Table 2-1. Emissions Modeled During Construction – NEPA Baseline

Source Category	NOx		SOx		CO		PM10		PM2.5
	1-Hr (lb/hr)	Annual (lb/yr)	1-Hr (lb/hr)	24-Hr (lb/day)	1-Hr (lb/hr)	8-Hr (lb/8hr)	24-Hr (lb/day)	Annual (lb/yr)	24-Hr (lb/day)
Construction Exhaust	2.9E+01	1.6E+03	2.1E-02	1.6E-01	1.1E+01	8.6E+01	5.1E+00	6.0E+01	4.7E+00
Construction Fugitive Dust	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	6.9E+01	1.7E+02	1.7E+01
Total	2.9E+01	1.6E+03	2.1E-02	1.6E-01	1.1E+01	8.6E+01	7.4E+01	2.3E+02	2.2E+01

Notes:
1. Maximum emissions within the modeling domain were selected from construction analysis years 2015 and 2016.
2. Maximum emissions from each source category were modeled together even if they would not occur simultaneously.
3. Construction exhaust includes emissions from off-road construction equipment, marine construction equipment, and on-road vehicles within the modeling domain.

Table 2-2. Emissions Modeled During Construction - Proposed Project without Mitigation

Source Category	NOx		SOx		CO		PM10		PM2.5
	1-Hr (lb/hr)	Annual (lb/yr)	1-Hr (lb/hr)	24-Hr (lb/day)	1-Hr (lb/hr)	8-Hr (lb/8hr)	24-Hr (lb/day)	Annual (lb/yr)	24-Hr (lb/day)
Construction Exhaust	8.5E+01	5.2E+04	2.1E-01	3.5E+00	4.9E+01	3.3E+02	2.3E+01	2.0E+03	4.1E+01
Construction Fugitive Dust	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	7.4E+01	2.4E+02	2.8E+00
Total	8.5E+01	5.2E+04	2.1E-01	3.5E+00	4.9E+01	3.3E+02	9.7E+01	2.2E+03	4.4E+01

Notes:
1. Maximum emissions within the modeling domain were selected from construction analysis years 2015 and 2016.
2. Maximum emissions from each source category were modeled together even if they would not occur simultaneously.
3. Construction exhaust includes emissions from off-road construction equipment, marine construction equipment, and on-road vehicles within the modeling domain.

Table 2-3. Emissions Modeled During Construction - Proposed Project with Mitigation

Source Category	NOx		SOx		CO		PM10		PM2.5
	1-Hr (lb/hr)	Annual (lb/yr)	1-Hr (lb/hr)	24-Hr (lb/day)	1-Hr (lb/hr)	8-Hr (lb/8hr)	24-Hr (lb/day)	Annual (lb/yr)	24-Hr (lb/day)
Construction Exhaust	3.6E+01	2.3E+04	1.8E-01	2.6E+00	3.3E+01	6.4E+01	5.4E+00	5.3E+02	5.1E+00
Construction Fugitive Dust	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	7.4E+01	2.4E+02	1.8E+01
Total	3.6E+01	2.3E+04	1.8E-01	2.6E+00	3.3E+01	6.4E+01	7.9E+01	7.7E+02	2.4E+01

Notes:
1. Maximum emissions within the modeling domain were selected from construction analysis years 2015 and 2016.
2. Maximum emissions from each source category were modeled together even if they would not occur simultaneously.
3. Construction exhaust includes emissions from off-road construction equipment, marine construction equipment, and on-road vehicles within the modeling domain.

Table 2-4. Emissions Modeled During Construction - No Federal Action Alternative without Mitigation

Source Category	NOx		SOx		CO		PM10		PM2.5
	1-Hr (lb/hr)	Annual (lb/yr)	1-Hr (lb/hr)	24-Hr (lb/day)	1-Hr (lb/hr)	8-Hr (lb/8hr)	24-Hr (lb/day)	Annual (lb/yr)	24-Hr (lb/day)
Construction Exhaust	2.9E+01	1.6E+03	2.1E-02	1.6E-01	1.1E+01	8.6E+01	5.1E+00	6.0E+01	4.7E+00
Construction Fugitive Dust	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	6.9E+01	1.7E+02	1.7E+01
Total	2.9E+01	1.6E+03	2.1E-02	1.6E-01	1.1E+01	8.6E+01	7.4E+01	2.3E+02	2.2E+01

Notes:
1. Maximum emissions within the modeling domain were selected from construction analysis years 2015 and 2016.
2. Maximum emissions from each source category were modeled together even if they would not occur simultaneously.
3. Construction exhaust includes emissions from off-road construction equipment, marine construction equipment, and on-road vehicles within the modeling domain.

Table 2-5. Emissions Modeled During Construction - No Federal Action Alternative with Mitigation

Source Category	NOx		SOx		CO		PM10		PM2.5
	1-Hr (lb/hr)	Annual (lb/yr)	1-Hr (lb/hr)	24-Hr (lb/day)	1-Hr (lb/hr)	8-Hr (lb/8hr)	24-Hr (lb/day)	Annual (lb/yr)	24-Hr (lb/day)
Construction Exhaust	1.1E+01	7.6E+02	2.1E-02	1.7E-01	8.2E+00	5.3E+01	7.2E-01	1.1E+01	7.0E-01
Construction Fugitive Dust	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	6.8E+01	1.7E+02	1.7E+01
Total	1.1E+01	7.6E+02	2.1E-02	1.7E-01	8.2E+00	5.3E+01	6.9E+01	1.8E+02	1.8E+01

Notes:
1. Maximum emissions within the modeling domain were selected from construction analysis years 2015 and 2016.
2. Maximum emissions from each source category were modeled together even if they would not occur simultaneously.
3. Construction exhaust includes emissions from off-road construction equipment, marine construction equipment, and on-road vehicles within the modeling domain.

Table 2-6. Emissions Modeled During Construction - Reduced Project Alternative without Mitigation

Source Category	NOx		SOx		CO		PM10		PM2.5
	1-Hr (lb/hr)	Annual (lb/yr)	1-Hr (lb/hr)	24-Hr (lb/day)	1-Hr (lb/hr)	8-Hr (lb/8hr)	24-Hr (lb/day)	Annual (lb/yr)	24-Hr (lb/day)
Construction Exhaust	7.8E+01	3.9E+04	2.1E-01	3.5E+00	4.1E+01	3.0E+02	1.6E+01	1.4E+03	4.1E+01
Construction Fugitive Dust	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	7.4E+01	2.4E+02	4.1E+00
Total	7.8E+01	3.9E+04	2.1E-01	3.5E+00	4.1E+01	3.0E+02	9.0E+01	1.7E+03	4.6E+01

Notes:
1. Maximum emissions within the modeling domain were selected from construction analysis years 2015 and 2016.
2. Maximum emissions from each source category were modeled together even if they would not occur simultaneously.
3. Construction exhaust includes emissions from off-road construction equipment, marine construction equipment, and on-road vehicles within the modeling domain.

Table 2-7. Emissions Modeled During Construction - Reduced Project Alternative with Mitigation

Source Category	NOx		SOx		CO		PM10		PM2.5
	1-Hr (lb/hr)	Annual (lb/yr)	1-Hr (lb/hr)	24-Hr (lb/day)	1-Hr (lb/hr)	8-Hr (lb/8hr)	24-Hr (lb/day)	Annual (lb/yr)	24-Hr (lb/day)
Construction Exhaust	3.2E+01	1.8E+04	1.8E-01	2.6E+00	2.3E+01	6.4E+01	3.7E+00	4.0E+02	3.5E+00
Construction Fugitive Dust	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	7.4E+01	2.4E+02	1.8E+01
Total	3.2E+01	1.8E+04	1.8E-01	2.6E+00	2.3E+01	6.4E+01	7.8E+01	6.4E+02	2.2E+01

Notes:
1. Maximum emissions within the modeling domain were selected from construction analysis years 2015 and 2016.
2. Maximum emissions from each source category were modeled together even if they would not occur simultaneously.
3. Construction exhaust includes emissions from off-road construction equipment, marine construction equipment, and on-road vehicles within the modeling domain.

The YTI terminal would continue to operate during construction; construction and operational activities would overlap during this time. SCAQMD has requested that total impacts be estimated during the period when construction and operational activities substantially overlap. Table 2-8 through Table 2-14 present a summary of overlapping construction and operational emissions used in the air dispersion modeling for the NEPA baseline, proposed Project without and with mitigation, Alternative 2 without and with mitigation, and Alternative 3 without and with mitigation. The CEQA baseline and Alternative 1 have no construction emissions and therefore are not presented. The modeled construction and operational emissions differ from the overlapping construction and operational emissions summarized in Section 3.2 of the EIS/EIR because (1) the dispersion modeling domain is smaller than the SCAB, and (2) as described above, the modeled emissions are a combination of peak emissions over multiple analysis years.

Table 2-8. Emissions Modeled During Overlapping Construction and Operation – NEPA Baseline

Source Category	NOx		SOx		CO		PM10		PM2.5
	1-Hr (lb/hr)	Annual (lb/yr)	1-Hr (lb/hr)	24-Hr (lb/day)	1-Hr (lb/hr)	8-Hr (lb/8hr)	24-Hr (lb/day)	Annual (lb/yr)	24-Hr (lb/day)
Construction Sources									
Construction Exhaust	2.9E+01	1.6E+03	2.1E-02	1.6E-01	1.1E+01	8.6E+01	5.1E+00	6.0E+01	4.7E+00
Construction Fugitive Dust	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	6.9E+01	1.7E+02	1.7E+01
Operational Sources									
Ships – Transit	6.2E+03	6.7E+05	1.5E+02	2.1E+02	6.7E+02	9.1E+02	1.5E+02	1.3E+04	1.2E+02
Ships - Anchoring	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	9.6E+01	0.0E+00
Ships – Hoteling	1.1E+02	1.5E+05	6.2E+00	6.5E+01	9.6E+00	7.7E+01	2.7E+01	4.2E+03	2.2E+01
Tugboats	2.7E+01	4.4E+04	9.3E-03	1.5E-01	1.3E+01	2.2E+02	1.0E+01	1.0E+03	9.0E+00
Trucks	9.2E+00	3.7E+04	1.1E-02	1.5E-01	4.1E+00	3.1E+01	1.2E+00	3.3E+02	7.8E-01
Line Haul Locomotives	2.3E+02	9.3E+04	1.8E-01	2.6E-01	5.0E+01	5.0E+01	9.3E+00	2.5E+03	8.6E+00
Switch Locomotives	2.2E+00	5.9E+03	3.3E-03	2.6E-02	9.2E-01	7.2E+00	1.7E-01	5.6E+01	1.5E-01
Cargo Handling Equipment	2.0E+01	5.6E+04	1.1E-01	1.7E+00	1.7E+01	1.3E+02	4.1E+00	7.1E+02	3.6E+00

Source Category	NOx		SOx		CO		PM10		PM2.5
	1-Hr (lb/hr)	Annual (lb/yr)	1-Hr (lb/hr)	24-Hr (lb/day)	1-Hr (lb/hr)	8-Hr (lb/8hr)	24-Hr (lb/day)	Annual (lb/yr)	24-Hr (lb/day)
Transport Refrigeration Units	5.6E-01	2.5E+03	1.0E-03	1.6E-02	6.3E-01	5.0E+00	4.5E-01	1.3E+02	4.4E-01
Worker Vehicles	4.9E-02	1.5E+02	8.5E-04	9.0E-03	5.3E-01	3.2E+00	1.0E-01	2.9E+01	4.9E-02
Reentrained Road Dust	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	7.4E+01	2.1E+04	1.8E+01
Total	**6.6E+03**	**1.1E+06**	**1.6E+02**	**2.7E+02**	**7.8E+02**	**1.5E+03**	**3.5E+02**	**4.3E+04**	**2.1E+02**

Notes:
1. Maximum emissions within the modeling domain were selected from construction analysis years 2015 and 2016.
2. Maximum emissions from each source category were modeled together even if they would not occur simultaneously.
3. Construction exhaust includes emissions from off-road construction equipment, marine construction equipment, and on-road vehicles within the modeling domain.
4. Emissions from ships while anchoring were zero for peak 1-hour, 8-hour, and 24-hour scenarios because peak short term emissions would occur when ships are transiting directly to or from berth and hoteling at berth.

Table 2-9. Emissions Modeled During Overlapping Construction and Operation - Proposed Project without Mitigation

Source Category	NOx		SOx		CO		PM10		PM2.5
	1-Hr (lb/hr)	Annual (lb/yr)	1-Hr (lb/hr)	24-Hr (lb/day)	1-Hr (lb/hr)	8-Hr (lb/8hr)	24-Hr (lb/day)	Annual (lb/yr)	24-Hr (lb/day)
Construction Sources									
Construction Exhaust	8.5E+01	5.2E+04	2.1E-01	3.5E+00	4.9E+01	3.3E+02	2.3E+01	2.0E+03	4.1E+01
Construction Fugitive Dust	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	7.4E+01	2.4E+02	2.8E+00
Operational Sources									
Ships - Transit	6.2E+03	6.7E+05	1.5E+02	2.1E+02	6.7E+02	9.1E+02	1.5E+02	1.3E+04	1.2E+02
Ships - Anchoring	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	9.6E+01	0.0E+00
Ships - Hoteling	1.1E+02	1.5E+05	6.2E+00	6.5E+01	9.6E+00	7.7E+01	2.7E+01	4.2E+03	2.2E+01
Tugboats	2.7E+01	4.4E+04	9.3E-03	1.5E-01	1.3E+01	2.2E+02	1.0E+01	1.0E+03	9.0E+00
Trucks	9.2E+00	3.7E+04	1.1E-02	1.5E-01	4.1E+00	3.1E+01	1.2E+00	3.3E+02	7.8E-01
Line Haul Locomotives	2.3E+02	9.3E+04	1.8E-01	2.6E-01	5.0E+01	5.0E+01	9.3E+00	2.5E+03	8.6E+00
Switch Locomotives	2.2E+00	5.9E+03	3.3E-03	2.6E-02	9.2E-01	7.2E+00	1.7E-01	5.6E+01	1.5E-01
Cargo Handling Equipment	2.0E+01	5.6E+04	1.1E-01	1.7E+00	1.7E+01	1.3E+02	4.1E+00	7.1E+02	3.6E+00
Transport Refrigeration Units	5.6E-01	2.5E+03	1.0E-03	1.6E-02	6.3E-01	5.0E+00	4.5E-01	1.3E+02	4.4E-01
Worker Vehicles	4.9E-02	1.5E+02	8.5E-04	9.0E-03	5.3E-01	3.2E+00	1.0E-01	2.9E+01	4.9E-02
Reentrained Road Dust	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	7.4E+01	2.1E+04	1.8E+01
Total	**6.7E+03**	**1.1E+06**	**1.6E+02**	**2.8E+02**	**8.2E+02**	**1.8E+03**	**3.8E+02**	**4.5E+04**	**2.3E+02**

Notes:
1. Maximum emissions within the modeling domain were selected from construction analysis years 2015 and 2016.
2. Maximum emissions from each source category were modeled together even if they would not occur simultaneously.
3. Construction exhaust includes emissions from off-road construction equipment, marine construction equipment, and on-road vehicles within the modeling domain.
4. Emissions from ships while anchoring were zero for peak 1-hour, 8-hour, and 24-hour scenarios because peak short term emissions would occur when ships are transiting directly to or from berth and hoteling at berth.

Table 2-10. Emissions Modeled During Overlapping Construction and Operation - Proposed Project with Mitigation

Source Category	NOx		SOx		CO		PM10		PM2.5
	1-Hr (lb/hr)	Annual (lb/yr)	1-Hr (lb/hr)	24-Hr (lb/day)	1-Hr (lb/hr)	8-Hr (lb/8hr)	24-Hr (lb/day)	Annual (lb/yr)	24-Hr (lb/day)
Construction Sources									
Construction Exhaust	3.6E+01	2.3E+04	1.8E-01	2.6E+00	3.3E+01	6.4E+01	5.4E+00	5.3E+02	5.1E+00
Construction Fugitive Dust	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	7.4E+01	2.4E+02	1.8E+01
Operational Sources									
Ships - Transit	6.2E+03	6.7E+05	1.5E+02	2.1E+02	6.7E+02	9.1E+02	1.5E+02	1.3E+04	1.2E+02
Ships - Anchoring	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	9.6E+01	0.0E+00
Ships - Hoteling	1.1E+02	1.5E+05	6.2E+00	6.5E+01	9.6E+00	7.7E+01	2.7E+01	4.2E+03	2.2E+01
Tugboats	2.7E+01	4.4E+04	9.3E-03	1.5E-01	1.3E+01	2.2E+02	1.0E+01	1.0E+03	9.0E+00
Trucks	9.2E+00	3.7E+04	1.1E-02	1.5E-01	4.1E+00	3.1E+01	1.2E+00	3.3E+02	7.8E-01
Line Haul Locomotives	2.3E+02	9.3E+04	1.8E-01	2.6E-01	5.0E+01	5.0E+01	9.3E+00	2.5E+03	8.6E+00
Switch Locomotives	2.2E+00	5.9E+03	3.3E-03	2.6E-02	9.2E-01	7.2E+00	1.7E-01	5.6E+01	1.5E-01
Cargo Handling Equipment	2.0E+01	5.6E+04	1.1E-01	1.7E+00	1.7E+01	1.3E+02	4.1E+00	7.1E+02	3.6E+00
Transport Refrigeration Units	5.6E-01	2.5E+03	1.0E-03	1.6E-02	6.3E-01	5.0E+00	4.5E-01	1.3E+02	4.4E-01
Worker Vehicles	4.9E-02	1.5E+02	8.5E-04	9.0E-03	5.3E-01	3.2E+00	1.0E-01	2.9E+01	4.9E-02
Reentrained Road Dust	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	7.4E+01	2.1E+04	1.8E+01
Total	**6.6E+03**	**1.1E+06**	**1.6E+02**	**2.8E+02**	**8.0E+02**	**1.5E+03**	**3.6E+02**	**4.3E+04**	**2.1E+02**

Notes:
1. Maximum emissions within the modeling domain were selected from construction analysis years 2015 and 2016.
2. Maximum emissions from each source category were modeled together even if they would not occur simultaneously.
3. Construction exhaust includes emissions from off-road construction equipment, marine construction equipment, and on-road vehicles within the modeling domain.
4. Emissions from ships while anchoring were zero for peak 1-hour, 8-hour, and 24-hour scenarios because peak short term emissions would occur when ships are transiting directly to or from berth and hoteling at berth.

Table 2-11. Emissions Modeled During Overlapping Construction and Operation - No Federal Action Alternative without Mitigation

Source Category	NOx		SOx		CO		PM10		PM2.5
	1-Hr (lb/hr)	Annual (lb/yr)	1-Hr (lb/hr)	24-Hr (lb/day)	1-Hr (lb/hr)	8-Hr (lb/8hr)	24-Hr (lb/day)	Annual (lb/yr)	24-Hr (lb/day)
Construction Sources									
Construction Exhaust	2.9E+01	1.6E+03	2.1E-02	1.6E-01	1.1E+01	8.6E+01	5.1E+00	6.0E+01	4.7E+00
Construction Fugitive Dust	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	6.9E+01	1.7E+02	1.7E+01
Operational Sources									
Ships - Transit	6.2E+03	6.7E+05	1.5E+02	2.1E+02	6.7E+02	9.1E+02	1.5E+02	1.3E+04	1.2E+02
Ships - Anchoring	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	9.6E+01	0.0E+00
Ships - Hoteling	1.1E+02	1.5E+05	6.2E+00	6.5E+01	9.6E+00	7.7E+01	2.7E+01	4.2E+03	2.2E+01
Tugboats	2.7E+01	4.4E+04	9.3E-03	1.5E-01	1.3E+01	2.2E+02	1.0E+01	1.0E+03	9.0E+00
Trucks	9.2E+00	3.7E+04	1.1E-02	1.5E-01	4.1E+00	3.1E+01	1.2E+00	3.3E+02	7.8E-01
Line Haul	2.3E+02	9.3E+04	1.8E-01	2.6E-01	5.0E+01	5.0E+01	9.3E+00	2.5E+03	8.6E+00

Source Category	NOx		SOx		CO		PM10		PM2.5
	1-Hr (lb/hr)	Annual (lb/yr)	1-Hr (lb/hr)	24-Hr (lb/day)	1-Hr (lb/hr)	8-Hr (lb/8hr)	24-Hr (lb/day)	Annual (lb/yr)	24-Hr (lb/day)
Locomotives									
Switch Locomotives	2.2E+00	5.9E+03	3.3E-03	2.6E-02	9.2E-01	7.2E+00	1.7E-01	5.6E+01	1.5E-01
Cargo Handling Equipment	2.0E+01	5.6E+04	1.1E-01	1.7E+00	1.7E+01	1.3E+02	4.1E+00	7.1E+02	3.6E+00
Transport Refrigeration Units	5.6E-01	2.5E+03	1.0E-03	1.6E-02	6.3E-01	5.0E+00	4.5E-01	1.3E+02	4.4E-01
Worker Vehicles	4.9E-02	1.5E+02	8.5E-04	9.0E-03	5.3E-01	3.2E+00	1.0E-01	2.9E+01	4.9E-02
Reentrained Road Dust	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	7.4E+01	2.1E+04	1.8E+01
Total	6.6E+03	1.1E+06	1.6E+02	2.7E+02	7.8E+02	1.5E+03	3.5E+02	4.3E+04	2.1E+02

Notes:
1. Maximum emissions within the modeling domain were selected from construction analysis years 2015 and 2016.
2. Maximum emissions from each source category were modeled together even if they would not occur simultaneously.
3. Construction exhaust includes emissions from off-road construction equipment, marine construction equipment, and on-road vehicles within the modeling domain.
4. Emissions from ships while anchoring were zero for peak 1-hour, 8-hour, and 24-hour scenarios because peak short term emissions would occur when ships are transiting directly to or from berth and hoteling at berth.

Table 2-12. Emissions Modeled During Overlapping Construction and Operation - No Federal Action Alternative with Mitigation

Source Category	NOx		SOx		CO		PM10		PM2.5
	1-Hr (lb/hr)	Annual (lb/yr)	1-Hr (lb/hr)	24-Hr (lb/day)	1-Hr (lb/hr)	8-Hr (lb/8hr)	24-Hr (lb/day)	Annual (lb/yr)	24-Hr (lb/day)
Construction Sources									
Construction Exhaust	1.1E+01	7.6E+02	2.1E-02	1.7E-01	8.2E+00	5.3E+01	7.2E-01	1.1E+01	7.0E-01
Construction Fugitive Dust	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	6.8E+01	1.7E+02	1.7E+01
Operational Sources									
Ships – Transit	6.2E+03	6.7E+05	1.5E+02	2.1E+02	6.7E+02	9.1E+02	1.5E+02	1.3E+04	1.2E+02
Ships - Anchoring	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	9.6E+01	0.0E+00
Ships - Hoteling	1.1E+02	1.5E+05	6.2E+00	6.5E+01	9.6E+00	7.7E+01	2.7E+01	4.2E+03	2.2E+01
Tugboats	2.7E+01	4.4E+04	9.3E-03	1.5E-01	1.3E+01	2.2E+02	1.0E+01	1.0E+03	9.0E+00
Trucks	9.2E+00	3.7E+04	1.1E-02	1.5E-01	4.1E+00	3.1E+01	1.2E+00	3.3E+02	7.8E-01
Line Haul Locomotives	2.3E+02	9.3E+04	1.8E-01	2.6E-01	5.0E+01	5.0E+01	9.3E+00	2.5E+03	8.6E+00
Switch Locomotives	2.2E+00	5.9E+03	3.3E-03	2.6E-02	9.2E-01	7.2E+00	1.7E-01	5.6E+01	1.5E-01
Cargo Handling Equipment	2.0E+01	5.6E+04	1.1E-01	1.7E+00	1.7E+01	1.3E+02	4.1E+00	7.1E+02	3.6E+00
Transport Refrigeration Units	5.6E-01	2.5E+03	1.0E-03	1.6E-02	6.3E-01	5.0E+00	4.5E-01	1.3E+02	4.4E-01
Worker Vehicles	4.9E-02	1.5E+02	8.5E-04	9.0E-03	5.3E-01	3.2E+00	1.0E-01	2.9E+01	4.9E-02
Reentrained Road Dust	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	7.4E+01	2.1E+04	1.8E+01
Total	**6.6E+03**	**1.1E+06**	**1.6E+02**	**2.7E+02**	**7.8E+02**	**1.5E+03**	**3.5E+02**	**4.3E+04**	**2.0E+02**

Notes:
1. Maximum emissions within the modeling domain were selected from construction analysis years 2015 and 2016.

Source Category	NOx		SOx		CO		PM10		PM2.5
	1-Hr (lb/hr)	Annual (lb/yr)	1-Hr (lb/hr)	24-Hr (lb/day)	1-Hr (lb/hr)	8-Hr (lb/8hr)	24-Hr (lb/day)	Annual (lb/yr)	24-Hr (lb/day)

2. Maximum emissions from each source category were modeled together even if they would not occur simultaneously.
3. Construction exhaust includes emissions from off-road construction equipment, marine construction equipment, and on-road vehicles within the modeling domain.
4. Emissions from ships while anchoring were zero for peak 1-hour, 8-hour, and 24-hour scenarios because peak short term emissions would occur when ships are transiting directly to or from berth and hoteling at berth.

Table 2-13. Emissions Modeled During Overlapping Construction and Operation - Reduced Project Alternative without Mitigation

Source Category	NOx		SOx		CO		PM10		PM2.5
	1-Hr (lb/hr)	Annual (lb/yr)	1-Hr (lb/hr)	24-Hr (lb/day)	1-Hr (lb/hr)	8-Hr (lb/8hr)	24-Hr (lb/day)	Annual (lb/yr)	24-Hr (lb/day)
Construction Sources									
Construction Exhaust	7.8E+01	3.9E+04	2.1E-01	3.5E+00	4.1E+01	3.0E+02	1.6E+01	1.4E+03	4.1E+01
Construction Fugitive Dust	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	7.4E+01	2.4E+02	4.1E+00
Operational Sources									
Ships - Transit	6.2E+03	6.7E+05	1.5E+02	2.1E+02	6.7E+02	9.1E+02	1.5E+02	1.3E+04	1.2E+02
Ships - Anchoring	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	9.6E+01	0.0E+00
Ships - Hoteling	1.1E+02	1.5E+05	6.2E+00	6.5E+01	9.6E+00	7.7E+01	2.7E+01	4.2E+03	2.2E+01
Tugboats	2.7E+01	4.4E+04	9.3E-03	1.5E-01	1.3E+01	2.2E+02	1.0E+01	1.0E+03	9.0E+00
Trucks	9.2E+00	3.7E+04	1.1E-02	1.5E-01	4.1E+00	3.1E+01	1.2E+00	3.3E+02	7.8E-01
Line Haul Locomotives	2.3E+02	9.3E+04	1.8E-01	2.6E-01	5.0E+01	5.0E+01	9.3E+00	2.5E+03	8.6E+00
Switch Locomotives	2.2E+00	5.9E+03	3.3E-03	2.6E-02	9.2E-01	7.2E+00	1.7E-01	5.6E+01	1.5E-01
Cargo Handling Equipment	2.0E+01	5.6E+04	1.1E-01	1.7E+00	1.7E+01	1.3E+02	4.1E+00	7.1E+02	3.6E+00
Transport Refrigeration Units	5.6E-01	2.5E+03	1.0E-03	1.6E-02	6.3E-01	5.0E+00	4.5E-01	1.3E+02	4.4E-01
Worker Vehicles	4.9E-02	1.5E+02	8.5E-04	9.0E-03	5.3E-01	3.2E+00	1.0E-01	2.9E+01	4.9E-02
Reentrained Road Dust	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	7.4E+01	2.1E+04	1.8E+01
Total	**6.7E+03**	**1.1E+06**	**1.6E+02**	**2.8E+02**	**8.1E+02**	**1.7E+03**	**3.7E+02**	**4.4E+04**	**2.3E+02**

Notes:
1. Maximum emissions within the modeling domain were selected from construction analysis years 2015 and 2016.
2. Maximum emissions from each source category were modeled together even if they would not occur simultaneously.
3. Construction exhaust includes emissions from off-road construction equipment, marine construction equipment, and on-road vehicles within the modeling domain.
4. Emissions from ships while anchoring were zero for peak 1-hour, 8-hour, and 24-hour scenarios because peak short term emissions would occur when ships are transiting directly to or from berth and hoteling at berth.

Table 2-14. Emissions Modeled During Overlapping Construction and Operation - Reduced Project Alternative with Mitigation

Source Category	NOx		SOx		CO		PM10		PM2.5
	1-Hr (lb/hr)	Annual (lb/yr)	1-Hr (lb/hr)	24-Hr (lb/day)	1-Hr (lb/hr)	8-Hr (lb/8hr)	24-Hr (lb/day)	Annual (lb/yr)	24-Hr (lb/day)
Construction Sources									
Construction Exhaust	3.2E+01	1.8E+04	1.8E-01	2.6E+00	2.3E+01	6.4E+01	3.7E+00	4.0E+02	3.5E+00
Construction Fugitive Dust	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	7.4E+01	2.4E+02	1.8E+01
Operational Sources									
Ships - Transit	6.2E+03	6.7E+05	1.5E+02	2.1E+02	6.7E+02	9.1E+02	1.5E+02	1.3E+04	1.2E+02
Ships - Anchoring	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	9.6E+01	0.0E+00
Ships - Hoteling	1.1E+02	1.5E+05	6.2E+00	6.5E+01	9.6E+00	7.7E+01	2.7E+01	4.2E+03	2.2E+01
Tugboats	2.7E+01	4.4E+04	9.3E-03	1.5E-01	1.3E+01	2.2E+02	1.0E+01	1.0E+03	9.0E+00
Trucks	9.2E+00	3.7E+04	1.1E-02	1.5E-01	4.1E+00	3.1E+01	1.2E+00	3.3E+02	7.8E-01
Line Haul Locomotives	2.3E+02	9.3E+04	1.8E-01	2.6E-01	5.0E+01	5.0E+01	9.3E+00	2.5E+03	8.6E+00
Switch Locomotives	2.2E+00	5.9E+03	3.3E-03	2.6E-02	9.2E-01	7.2E+00	1.7E-01	5.6E+01	1.5E-01
Cargo Handling Equipment	2.0E+01	5.6E+04	1.1E-01	1.7E+00	1.7E+01	1.3E+02	4.1E+00	7.1E+02	3.6E+00
Transport Refrigeration Units	5.6E-01	2.5E+03	1.0E-03	1.6E-02	6.3E-01	5.0E+00	4.5E-01	1.3E+02	4.4E-01
Worker Vehicles	4.9E-02	1.5E+02	8.5E-04	9.0E-03	5.3E-01	3.2E+00	1.0E-01	2.9E+01	4.9E-02
Reentrained Road Dust	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	7.4E+01	2.1E+04	1.8E+01
Total	**6.6E+03**	**1.1E+06**	**1.6E+02**	**2.8E+02**	**7.9E+02**	**1.5E+03**	**3.6E+02**	**4.3E+04**	**2.1E+02**

Notes:
1. Maximum emissions within the modeling domain were selected from construction analysis years 2015 and 2016.
2. Maximum emissions from each source category were modeled together even if they would not occur simultaneously.
3. Construction exhaust includes emissions from off-road construction equipment, marine construction equipment, and on-road vehicles within the modeling domain.
4. Emissions from ships while anchoring were zero for peak 1-hour, 8-hour, and 24-hour scenarios because peak short term emissions would occur when ships are transiting directly to or from berth and hoteling at berth.

2.3 Operational Emission Sources

Both on-site and off-site emission sources were included in the modeling of operational emissions. The following operational emission sources were included in the air dispersion modeling for NO_2, SO_2, CO, PM_{10}, and $PM_{2.5}$:

- Container ships transiting to and from berth. Ship transit emission sources are comprised of propulsion and auxiliary engines and boiler exhaust. Ship transit in SCAQMD waters consists of transit in the fairway, precautionary zone, and the harbor. Ships transiting were modeled as far as the SCAB overwater boundary, approximately 40 nautical miles.

- Container ships hoteling while at berth and at anchorage in the harbor. Ship hoteling emission sources are comprised of ship auxiliary engines (except when using AMP) and boiler exhaust; propulsion engines would be turned off.
- Tugboats used to assist container ships between the Port breakwater and the berth. Two tugboats were assumed to assist each ship. Tugboat emission sources are comprised of propulsion and auxiliary engines.
- On-road trucks driving on near-Port roads, at the YTI terminal, and idling on-terminal and at the YTI terminal gate. Truck transit emission sources are comprised of exhaust, brake wear, tire wear and entrained road dust. Trucks were modeled as far as approximately 3 miles north of the terminal, a distance established in prior LAHD NEPA/CEQA documents as sufficient to capture maximum concentrations for container terminal projects (LAHD 2011).
- Locomotives switching and idling at the TICTF on-dock rail yard, and line haul locomotives pulling trains between the TICTF on-dock rail yard and the Alameda Corridor. Locomotives traveling were modeled as far as approximately 3 miles north of the terminal.
- Cargo handling equipment (CHE) operating at the YTI terminal and TICTF, including forklifts, rubber-tired gantry cranes, top handlers, and yard tractors.
- Transport refrigeration units (TRUs) operating at the TICTF.
- Worker vehicles driving to and from the YTI terminal. Worker vehicle emission sources are comprised of exhaust, brake wear, tire wear and entrained road dust. Worker vehicles were modeled as far as approximately 3 miles north of the terminal.

2.4 Operational Emissions

To evaluate the air quality impacts of project operations, peak operational emissions were calculated for the project analysis years 2017, 2020, and 2026. To ensure the capture of maximum ambient pollutant concentrations in AERMOD, peak emissions were modeled for each emission source category, even if the peak emissions would occur in different analysis years. For example, peak operational emissions were determined separately for automobile exhaust, automobile tire and brake wear, automobile road dust, cargo handling equipment, harborcraft, line haul locomotives, ships during hoteling and anchorage, ships during transit, truck exhaust, truck tire and brake wear, truck road dust, transport refrigeration units, and switch locomotives. These peak emissions were conservatively modeled together in AERMOD even if they would occur during different analysis years. Table 2-15 through Table 2-23 present operational emissions used in dispersion modeling for the CEQA baseline, NEPA baseline, proposed Project without and with mitigation, Alternative 1, Alternative 2 without and with mitigation, and Alternative 3 without and with mitigation. The modeled operational emissions differ from the operational emissions summarized in Section 3.2 of the EIS/EIR because (1) the dispersion modeling domain is smaller than the SCAB, and (2) as described above, the modeled emissions are a combination of peak emissions over multiple analysis years.

Table 2-15. Emissions Modeled During Operation - CEQA Baseline

Source Category	NOx		SOx		CO		PM10		PM2.5
	1-Hr (lb/hr)	Annual (lb/yr)	1-Hr (lb/hr)	24-Hr (lb/day)	1-Hr (lb/hr)	8-Hr (lb/8hr)	24-Hr (lb/day)	Annual (lb/yr)	24-Hr (lb/day)
Ships – Transit	5.1E+03	6.0E+05	6.0E+02	7.6E+02	5.7E+02	7.2E+02	1.7E+02	1.6E+04	1.4E+02
Ships – Anchoring	0.0E+00	1.1E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.9E+02	0.0E+00
Ships – Hoteling	9.0E+01	2.5E+05	2.5E+01	3.8E+02	8.2E+00	6.0E+01	4.7E+01	9.4E+03	3.8E+01
Tugboats	2.0E+01	3.5E+04	6.9E-03	1.1E-01	1.0E+01	1.6E+02	7.6E+00	8.2E+02	6.8E+00
Trucks	7.8E+00	3.2E+04	1.0E-02	1.4E-01	3.3E+00	2.4E+01	1.0E+00	3.0E+02	6.7E-01
Line Haul Locomotives	2.3E+02	7.6E+04	9.0E-01	1.2E+00	5.0E+01	5.0E+01	1.0E+01	2.5E+03	9.5E+00
Switch Locomotives	2.2E+00	4.6E+03	3.3E-03	2.1E-02	9.2E-01	5.7E+00	1.3E-01	4.4E+01	1.2E-01
Cargo Handling Equipment	3.1E+01	8.3E+04	8.5E-02	1.4E+00	1.3E+01	1.1E+02	9.6E+00	1.6E+03	8.5E+00
Transport Refrigeration Units	5.5E-01	2.6E+03	7.1E-04	1.1E-02	5.1E-01	4.1E+00	7.3E-01	2.2E+02	7.2E-01
Worker Vehicles	5.2E-02	1.6E+02	6.6E-04	7.1E-03	5.8E-01	3.5E+00	8.6E-02	2.5E+01	4.3E-02
Reentrained Road Dust	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	6.7E+01	2.0E+04	1.7E+01
Total	**5.5E+03**	**1.1E+06**	**6.3E+02**	**1.1E+03**	**6.6E+02**	**1.1E+03**	**3.1E+02**	**5.1E+04**	**2.2E+02**

Notes:
1. Maximum emissions within the modeling domain were selected from operational analysis years 2017, 2020, and 2026.
2. Maximum emissions from each source category were modeled together even if they would not occur simultaneously.
3. Emissions from ships while anchoring are zero for peak 1-hour, 8-hour, and 24-hour scenarios because peak short term emissions would occur when ships are transiting directly to or from berth and hoteling at berth.

Table 2-16. Emissions Modeled During Operation – NEPA Baseline

Source Category	NOx		SOx		CO		PM10		PM2.5
	1-Hr (lb/hr)	Annual (lb/yr)	1-Hr (lb/hr)	24-Hr (lb/day)	1-Hr (lb/hr)	8-Hr (lb/8hr)	24-Hr (lb/day)	Annual (lb/yr)	24-Hr (lb/day)
Ships - Transit	6.8E+03	7.2E+05	1.6E+02	2.2E+02	7.3E+02	9.9E+02	1.7E+02	1.4E+04	1.3E+02
Ships - Anchoring	0.0E+00	4.8E+03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.2E+02	0.0E+00
Ships - Hoteling	7.6E+01	1.0E+05	5.1E+00	5.3E+01	7.0E+00	5.6E+01	2.1E+01	3.2E+03	1.7E+01
Tugboats	2.7E+01	4.4E+04	9.3E-03	1.5E-01	1.3E+01	2.2E+02	1.0E+01	1.0E+03	9.0E+00
Trucks	9.5E+00	3.8E+04	1.4E-02	2.0E-01	4.6E+00	3.4E+01	1.5E+00	4.2E+02	1.0E+00
Line Haul Locomotives	2.2E+02	9.0E+04	2.0E-01	3.6E-01	5.6E+01	5.6E+01	7.9E+00	2.3E+03	7.3E+00
Switch Locomotives	2.2E+00	6.6E+03	3.3E-03	3.3E-02	9.7E-01	7.7E+00	1.9E-01	6.3E+01	1.7E-01
Cargo Handling Equipment	1.6E+01	4.4E+04	1.4E-01	2.3E+00	2.2E+01	1.7E+02	3.4E+00	6.1E+02	3.0E+00
Transport Refrigeration Units	6.4E-01	2.8E+03	1.4E-03	2.2E-02	7.3E-01	5.8E+00	3.1E-01	8.4E+01	3.0E-01
Worker Vehicles	4.3E-02	1.3E+02	1.1E-03	1.1E-02	4.6E-01	2.8E+00	1.3E-01	3.6E+01	6.3E-02
Reentrained Road Dust	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	9.7E+01	2.7E+04	2.4E+01
Total	**7.1E+03**	**1.1E+06**	**1.7E+02**	**2.8E+02**	**8.4E+02**	**1.5E+03**	**3.1E+02**	**4.8E+04**	**1.9E+02**

Notes:
1. Maximum emissions within the modeling domain were selected from operational analysis years 2017, 2020, and 2026.
2. Maximum emissions from each source category were modeled together even if they would not occur simultaneously.
3. Emissions from ships while anchoring are zero for peak 1-hour, 8-hour, and 24-hour scenarios because peak short term emissions would occur when ships are transiting directly to or from berth and hoteling at berth.

Table 2-17. Emissions Modeled During Operation - Proposed Project without Mitigation

Source Category	NOx		SOx		CO		PM10		PM2.5
	1-Hr (lb/hr)	Annual (lb/yr)	1-Hr (lb/hr)	24-Hr (lb/day)	1-Hr (lb/hr)	8-Hr (lb/8hr)	24-Hr (lb/day)	Annual (lb/yr)	24-Hr (lb/day)
Ships - Transit	7.0E+03	7.5E+05	1.7E+02	2.4E+02	7.5E+02	1.0E+03	1.7E+02	1.4E+04	1.4E+02
Ships - Anchoring	0.0E+00	6.0E+03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.4E+02	0.0E+00
Ships - Hoteling	1.0E+02	1.2E+05	6.2E+00	1.0E+02	9.5E+00	7.6E+01	4.5E+01	3.5E+03	3.6E+01
Tugboats	2.7E+01	4.4E+04	9.3E-03	1.5E-01	1.3E+01	2.2E+02	1.0E+01	1.0E+03	9.0E+00
Trucks	1.1E+01	4.2E+04	1.5E-02	2.2E-01	5.2E+00	3.8E+01	1.7E+00	4.7E+02	1.1E+00
Line Haul Locomotives	2.2E+02	9.6E+04	2.0E-01	4.4E-01	5.6E+01	7.8E+01	8.7E+00	2.4E+03	8.0E+00
Switch Locomotives	2.2E+00	7.5E+03	3.3E-03	3.9E-02	9.7E-01	7.7E+00	2.1E-01	7.0E+01	1.9E-01
Cargo Handling Equipment	1.6E+01	4.7E+04	1.6E-01	2.6E+00	2.5E+01	2.0E+02	3.8E+00	6.7E+02	3.4E+00
Transport Refrigeration Units	7.3E-01	3.2E+03	1.5E-03	2.4E-02	8.2E-01	6.6E+00	3.2E-01	8.8E+01	3.2E-01
Worker Vehicles	4.6E-02	1.3E+02	1.2E-03	1.3E-02	4.9E-01	3.0E+00	1.5E-01	4.1E+01	7.1E-02
Reentrained Road Dust	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.1E+02	2.9E+04	2.7E+01
Total	**7.4E+03**	**1.1E+06**	**1.8E+02**	**3.4E+02**	**8.6E+02**	**1.6E+03**	**3.5E+02**	**5.2E+04**	**2.2E+02**

Notes:
1. Maximum emissions within the modeling domain were selected from operational analysis years 2017, 2020, and 2026.
2. Maximum emissions from each source category were modeled together even if they would not occur simultaneously.
3. Emissions from ships while anchoring are zero for peak 1-hour, 8-hour, and 24-hour scenarios because peak short term emissions would occur when ships are transiting directly to or from berth and hoteling at berth.

Table 2-18. Emissions Modeled During Operation - Proposed Project with Mitigation

Source Category	NOx		SOx		CO		PM10		PM2.5
	1-Hr (lb/hr)	Annual (lb/yr)	1-Hr (lb/hr)	24-Hr (lb/day)	1-Hr (lb/hr)	8-Hr (lb/8hr)	24-Hr (lb/day)	Annual (lb/yr)	24-Hr (lb/day)
Ships - Transit	6.6E+03	7.1E+05	1.6E+02	2.1E+02	7.3E+02	9.9E+02	1.6E+02	1.4E+04	1.3E+02
Ships - Anchoring	0.0E+00	6.0E+03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.4E+02	0.0E+00
Ships - Hoteling	1.0E+02	1.2E+05	6.2E+00	1.0E+02	9.5E+00	7.6E+01	4.4E+01	3.5E+03	3.6E+01
Tugboats	2.7E+01	4.4E+04	9.3E-03	1.5E-01	1.3E+01	2.2E+02	1.0E+01	1.0E+03	9.0E+00
Trucks	1.1E+01	4.2E+04	1.5E-02	2.2E-01	5.2E+00	3.8E+01	1.7E+00	4.7E+02	1.1E+00
Line Haul Locomotives	2.2E+02	9.6E+04	2.0E-01	4.4E-01	5.6E+01	7.8E+01	8.7E+00	2.4E+03	8.0E+00
Switch Locomotives	2.2E+00	7.5E+03	3.3E-03	3.9E-02	9.7E-01	7.7E+00	2.1E-01	7.0E+01	1.9E-01
Cargo Handling Equipment	1.6E+01	4.7E+04	1.6E-01	2.6E+00	2.5E+01	2.0E+02	3.8E+00	6.7E+02	3.4E+00
Transport Refrigeration Units	7.3E-01	3.2E+03	1.5E-03	2.4E-02	8.2E-01	6.6E+00	3.2E-01	8.8E+01	3.2E-01
Worker Vehicles	4.6E-02	1.3E+02	1.2E-03	1.3E-02	4.9E-01	3.0E+00	1.5E-01	4.1E+01	7.1E-02
Reentrained Road Dust	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.1E+02	2.9E+04	2.7E+01
Total	**6.9E+03**	**1.1E+06**	**1.7E+02**	**3.2E+02**	**8.5E+02**	**1.6E+03**	**3.4E+02**	**5.2E+04**	**2.1E+02**

Notes:
1. Maximum emissions within the modeling domain were selected from operational analysis years 2017, 2020, and 2026.
2. Maximum emissions from each source category were modeled together even if they would not occur simultaneously.
3. Emissions from ships while anchoring are zero for peak 1-hour, 8-hour, and 24-hour scenarios because peak short term emissions would occur when ships are transiting directly to or from berth and hoteling at berth.

Table 2-19. Emissions Modeled During Operation - No Project Alternative

Source Category	NOx		SOx		CO		PM10		PM2.5
	1-Hr (lb/hr)	Annual (lb/yr)	1-Hr (lb/hr)	24-Hr (lb/day)	1-Hr (lb/hr)	8-Hr (lb/8hr)	24-Hr (lb/day)	Annual (lb/yr)	24-Hr (lb/day)
Ships - Transit	6.8E+03	7.2E+05	1.6E+02	2.2E+02	7.3E+02	9.9E+02	1.7E+02	1.4E+04	1.3E+02
Ships - Anchoring	0.0E+00	4.8E+03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.2E+02	0.0E+00
Ships - Hoteling	7.6E+01	1.0E+05	5.1E+00	5.3E+01	7.0E+00	5.6E+01	2.1E+01	3.2E+03	1.7E+01
Tugboats	2.7E+01	4.4E+04	9.3E-03	1.5E-01	1.3E+01	2.2E+02	1.0E+01	1.0E+03	9.0E+00
Trucks	9.5E+00	3.8E+04	1.4E-02	2.0E-01	4.6E+00	3.4E+01	1.5E+00	4.2E+02	1.0E+00
Line Haul Locomotives	2.2E+02	9.0E+04	2.0E-01	3.6E-01	5.6E+01	5.6E+01	7.9E+00	2.3E+03	7.3E+00
Switch Locomotives	2.2E+00	6.6E+03	3.3E-03	3.3E-02	9.7E-01	7.7E+00	1.9E-01	6.3E+01	1.7E-01
Cargo Handling Equipment	1.6E+01	4.4E+04	1.4E-01	2.3E+00	2.2E+01	1.7E+02	3.4E+00	6.1E+02	3.0E+00
Transport Refrigeration Units	6.4E-01	2.8E+03	1.4E-03	2.2E-02	7.3E-01	5.8E+00	3.1E-01	8.4E+01	3.0E-01
Worker Vehicles	4.3E-02	1.3E+02	1.1E-03	1.1E-02	4.6E-01	2.8E+00	1.3E-01	3.6E+01	6.3E-02
Reentrained Road Dust	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	9.7E+01	2.7E+04	2.4E+01
Total	**7.1E+03**	**1.1E+06**	**1.7E+02**	**2.8E+02**	**8.4E+02**	**1.5E+03**	**3.1E+02**	**4.8E+04**	**1.9E+02**

Notes:
1. Maximum emissions within the modeling domain were selected from operational analysis years 2017, 2020, and 2026.
2. Maximum emissions from each source category were modeled together even if they would not occur simultaneously.
3. Emissions from ships while anchoring are zero for peak 1-hour, 8-hour, and 24-hour scenarios because peak short term emissions would occur when ships are transiting directly to or from berth and hoteling at berth.

Table 2-20. Emissions Modeled During Operation - No Federal Action Alternative without Mitigation

Source Category	NOx		SOx		CO		PM10		PM2.5
	1-Hr (lb/hr)	Annual (lb/yr)	1-Hr (lb/hr)	24-Hr (lb/day)	1-Hr (lb/hr)	8-Hr (lb/8hr)	24-Hr (lb/day)	Annual (lb/yr)	24-Hr (lb/day)
Ships - Transit	6.8E+03	7.2E+05	1.6E+02	2.2E+02	7.3E+02	9.9E+02	1.7E+02	1.4E+04	1.3E+02
Ships - Anchoring	0.0E+00	4.8E+03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.2E+02	0.0E+00
Ships - Hoteling	7.6E+01	1.0E+05	5.1E+00	5.3E+01	7.0E+00	5.6E+01	2.1E+01	3.2E+03	1.7E+01
Tugboats	2.7E+01	4.4E+04	9.3E-03	1.5E-01	1.3E+01	2.2E+02	1.0E+01	1.0E+03	9.0E+00
Trucks	9.5E+00	3.8E+04	1.4E-02	2.0E-01	4.6E+00	3.4E+01	1.5E+00	4.2E+02	1.0E+00
Line Haul Locomotives	2.2E+02	9.0E+04	2.0E-01	3.6E-01	5.6E+01	5.6E+01	7.9E+00	2.3E+03	7.3E+00
Switch Locomotives	2.2E+00	6.6E+03	3.3E-03	3.3E-02	9.7E-01	7.7E+00	1.9E-01	6.3E+01	1.7E-01
Cargo Handling Equipment	1.6E+01	4.4E+04	1.4E-01	2.3E+00	2.2E+01	1.7E+02	3.4E+00	6.1E+02	3.0E+00
Transport Refrigeration Units	6.4E-01	2.8E+03	1.4E-03	2.2E-02	7.3E-01	5.8E+00	3.1E-01	8.4E+01	3.0E-01
Worker Vehicles	4.3E-02	1.3E+02	1.1E-03	1.1E-02	4.6E-01	2.8E+00	1.3E-01	3.6E+01	6.3E-02
Reentrained Road Dust	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	9.7E+01	2.7E+04	2.4E+01
Total	**7.1E+03**	**1.1E+06**	**1.7E+02**	**2.8E+02**	**8.4E+02**	**1.5E+03**	**3.1E+02**	**4.8E+04**	**1.9E+02**

Notes:
1. Maximum emissions within the modeling domain were selected from operational analysis years 2017, 2020, and 2026.
2. Maximum emissions from each source category were modeled together even if they would not occur simultaneously.
3. Emissions from ships while anchoring are zero for peak 1-hour, 8-hour, and 24-hour scenarios because peak short term emissions would occur when ships are transiting directly to or from berth and hoteling at berth.

Table 2-21. Emissions Modeled During Operation - No Federal Action Alternative with Mitigation

Source Category	NOx		SOx		CO		PM10		PM2.5
	1-Hr (lb/hr)	Annual (lb/yr)	1-Hr (lb/hr)	24-Hr (lb/day)	1-Hr (lb/hr)	8-Hr (lb/8hr)	24-Hr (lb/day)	Annual (lb/yr)	24-Hr (lb/day)
Ships - Transit	6.4E+03	6.8E+05	1.5E+02	2.0E+02	7.1E+02	9.6E+02	1.5E+02	1.3E+04	1.2E+02
Ships - Anchoring	0.0E+00	4.8E+03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.2E+02	0.0E+00
Ships - Hoteling	7.6E+01	1.0E+05	5.1E+00	5.3E+01	7.0E+00	5.6E+01	2.1E+01	3.2E+03	1.7E+01
Tugboats	2.7E+01	4.4E+04	9.3E-03	1.5E-01	1.3E+01	2.2E+02	1.0E+01	1.0E+03	9.0E+00
Trucks	9.5E+00	3.8E+04	1.4E-02	2.0E-01	4.6E+00	3.4E+01	1.5E+00	4.2E+02	1.0E+00
Line Haul Locomotives	2.2E+02	9.0E+04	2.0E-01	3.6E-01	5.6E+01	5.6E+01	7.9E+00	2.3E+03	7.3E+00
Switch Locomotives	2.2E+00	6.6E+03	3.3E-03	3.3E-02	9.7E-01	7.7E+00	1.9E-01	6.3E+01	1.7E-01
Cargo Handling Equipment	1.6E+01	4.4E+04	1.4E-01	2.3E+00	2.2E+01	1.7E+02	3.4E+00	6.1E+02	3.0E+00
Transport Refrigeration Units	6.4E-01	2.8E+03	1.4E-03	2.2E-02	7.3E-01	5.8E+00	3.1E-01	8.4E+01	3.0E-01
Worker Vehicles	4.3E-02	1.3E+02	1.1E-03	1.1E-02	4.6E-01	2.8E+00	1.3E-01	3.6E+01	6.3E-02
Reentrained Road Dust	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	9.7E+01	2.7E+04	2.4E+01
Total	**6.7E+03**	**1.0E+06**	**1.6E+02**	**2.6E+02**	**8.2E+02**	**1.5E+03**	**3.0E+02**	**4.8E+04**	**1.9E+02**

Notes:
1. Maximum emissions within the modeling domain were selected from operational analysis years 2017, 2020, and 2026.
2. Maximum emissions from each source category were modeled together even if they would not occur simultaneously.
3. Emissions from ships while anchoring are zero for peak 1-hour, 8-hour, and 24-hour scenarios because peak short term emissions would occur when ships are transiting directly to or from berth and hoteling at berth.

Table 2-22. Emissions Modeled During Operation - Reduced Project Alternative without Mitigation

Source Category	NOx		SOx		CO		PM10		PM2.5
	1-Hr (lb/hr)	Annual (lb/yr)	1-Hr (lb/hr)	24-Hr (lb/day)	1-Hr (lb/hr)	8-Hr (lb/8hr)	24-Hr (lb/day)	Annual (lb/yr)	24-Hr (lb/day)
Ships – Transit	9.0E+03	8.5E+05	2.2E+02	3.0E+02	9.8E+02	1.3E+03	2.2E+02	1.6E+04	1.8E+02
Ships – Anchoring	0.0E+00	5.6E+03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.3E+02	0.0E+00
Ships – Hoteling	8.3E+01	1.1E+05	6.1E+00	8.6E+01	7.6E+00	6.1E+01	3.4E+01	3.6E+03	2.7E+01
Tugboats	2.7E+01	4.4E+04	1.2E-02	1.9E-01	1.3E+01	2.2E+02	1.0E+01	1.0E+03	9.0E+00
Trucks	1.1E+01	4.2E+04	1.5E-02	2.2E-01	5.2E+00	3.8E+01	1.7E+00	4.7E+02	1.1E+00
Line Haul Locomotives	2.2E+02	9.6E+04	2.0E-01	4.4E-01	5.6E+01	7.8E+01	8.7E+00	2.4E+03	8.0E+00
Switch Locomotives	2.2E+00	7.5E+03	3.3E-03	3.9E-02	9.7E-01	7.7E+00	2.1E-01	7.0E+01	1.9E-01
Cargo Handling Equipment	1.6E+01	4.7E+04	1.6E-01	2.6E+00	2.5E+01	2.0E+02	3.8E+00	6.7E+02	3.4E+00
Transport Refrigeration Units	7.3E-01	3.2E+03	1.5E-03	2.4E-02	8.2E-01	6.6E+00	3.2E-01	8.8E+01	3.2E-01
Worker Vehicles	4.6E-02	1.3E+02	1.2E-03	1.3E-02	4.9E-01	3.0E+00	1.5E-01	4.1E+01	7.1E-02
Reentrained Road Dust	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.1E+02	2.9E+04	2.7E+01

Source Category	NOx		SOx		CO		PM10		PM2.5
	1-Hr (lb/hr)	Annual (lb/yr)	1-Hr (lb/hr)	24-Hr (lb/day)	1-Hr (lb/hr)	8-Hr (lb/8hr)	24-Hr (lb/day)	Annual (lb/yr)	24-Hr (lb/day)
Total	**9.4E+03**	**1.2E+06**	**2.2E+02**	**3.9E+02**	**1.1E+03**	**1.9E+03**	**3.9E+02**	**5.4E+04**	**2.5E+02**

Notes:
1. Maximum emissions within the modeling domain were selected from operational analysis years 2017, 2020, and 2026.
2. Maximum emissions from each source category were modeled together even if they would not occur simultaneously.
3. Emissions from ships while anchoring are zero for peak 1-hour, 8-hour, and 24-hour scenarios because peak short term emissions would occur when ships are transiting directly to or from berth and hoteling at berth.

Table 2-23. Emissions Modeled During Operation - Reduced Project Alternative with Mitigation

Source Category	NOx		SOx		CO		PM10		PM2.5
	1-Hr (lb/hr)	Annual (lb/yr)	1-Hr (lb/hr)	24-Hr (lb/day)	1-Hr (lb/hr)	8-Hr (lb/8hr)	24-Hr (lb/day)	Annual (lb/yr)	24-Hr (lb/day)
Ships – Transit	8.2E+03	8.1E+05	2.0E+02	2.6E+02	9.5E+02	1.3E+03	2.0E+02	1.6E+04	1.6E+02
Ships – Anchoring	0.0E+00	5.6E+03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.3E+02	0.0E+00
Ships – Hoteling	7.5E+01	1.1E+05	5.8E+00	8.6E+01	6.9E+00	5.5E+01	3.4E+01	3.6E+03	2.7E+01
Tugboats	2.7E+01	4.4E+04	1.2E-02	1.9E-01	1.3E+01	2.2E+02	1.0E+01	1.0E+03	9.0E+00
Trucks	1.1E+01	4.2E+04	1.5E-02	2.2E-01	5.2E+00	3.8E+01	1.7E+00	4.7E+02	1.1E+00
Line Haul Locomotives	2.2E+02	9.6E+04	2.0E-01	4.4E-01	5.6E+01	7.8E+01	8.7E+00	2.4E+03	8.0E+00
Switch Locomotives	2.2E+00	7.5E+03	3.3E-03	3.9E-02	9.7E-01	7.7E+00	2.1E-01	7.0E+01	1.9E-01
Cargo Handling Equipment	1.6E+01	4.7E+04	1.6E-01	2.6E+00	2.5E+01	2.0E+02	3.8E+00	6.7E+02	3.4E+00
Transport Refrigeration Units	7.3E-01	3.2E+03	1.5E-03	2.4E-02	8.2E-01	6.6E+00	3.2E-01	8.8E+01	3.2E-01
Worker Vehicles	4.6E-02	1.3E+02	1.2E-03	1.3E-02	4.9E-01	3.0E+00	1.5E-01	4.1E+01	7.1E-02
Reentrained Road Dust	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.1E+02	2.9E+04	2.7E+01
Total	**8.6E+03**	**1.2E+06**	**2.0E+02**	**3.5E+02**	**1.1E+03**	**1.9E+03**	**3.7E+02**	**5.3E+04**	**2.4E+02**

Notes:
1. Maximum emissions within the modeling domain were selected from operational analysis years 2017, 2020, and 2026.
2. Maximum emissions from each source category were modeled together even if they would not occur simultaneously.
3. Emissions from ships while anchoring are zero for peak 1-hour, 8-hour, and 24-hour scenarios because peak short term emissions would occur when ships are transiting directly to or from berth and hoteling at berth.

3.0 Dispersion Modeling

3.1 Dispersion Model Selection and Inputs

The air dispersion modeling was performed using the USEPA AERMOD dispersion model, version 12345, based on the Guideline on Air Quality Models (40 CFR, Part 51, Appendix W; November 9, 2005). The AERMOD model is a steady-state, multiple source, Gaussian dispersion model designed for use with emission sources situated in terrain where ground elevations can exceed the emission source stack heights. The AERMOD model requires hourly meteorological data consisting of wind direction, wind speed, temperature, stability class, and mixing height.

Selection of the AERMOD model is well suited for this analysis because it is (1) accepted by the modeling community and regulatory agencies due to of its ability to provide reasonable results for large industrial projects with multiple emission sources, (2) annual sets of hourly meteorological data is available in AERMOD format, and (3) the model can handle various sources types, including point, area, line, and volume source types. Finally, AERMOD is approved by the USEPA and SCAQMD for analysis of mobile sources.

In addition to air dispersion modeling using AERMOD for all project sources, modeling of traffic-related CO impacts was also conducted for the maximally impacted intersection of Henry Ford Avenue and Anaheim Street. This CO "hot spots" analysis was performed using CAL3QHC, as described in Impact AQ-5 of Section 3.2. The CAL3QHC model output files are included in Attachment B2.1.

3.1.1 Construction Emission Sources

During project construction, the hoteling crane delivery ship was modeled as a point source positioned in the expected docking locations. All other construction sources, including harborcraft, offroad construction equipment, trucks, and fugitive dust, were modeled as poly-area sources covering the portions of the construction site where those sources would be active.

Table 3-1 presents source parameters used in the dispersion modeling for project construction. The source parameters are consistent with those developed and used in prior LAHD NEPA/CEQA documents (LAHD 2008; LAHD 2011).

Table 3-1. AERMOD Source Release Parameters – Construction Sources

Source Description	AERMOD Source Type	Release Height (m)	Initial Vertical Dimension (m) [a]	Exit Velocity (m/s)	Exit Temperature (K)	Stack Diameter (m)
Crane delivery ship hotelling – auxiliary engines and boilers	point	37.19	--	9.14	572	0.39
Harbor craft [c]	poly-area	15.24	3.54	--	--	--
Offroad construction equipment [c]	poly-area	4.57	1.06	--	--	--
Haul/delivery trucks idling and transiting onsite [b]	poly-area	4.57	1.06	--	--	--
Construction fugitive dust [c]	poly-area	1.0	0.23	--	--	--

Notes:
a. The initial vertical dimension of the plume (σz) was estimated by dividing the initial vertical thickness by 4.3 for elevated releases and by 2.15 for ground-based releases.
b. Release height and initial vertical dimension are consistent with prior LAHD documents (LAHD 2008; LAHD 2011).

3.1.2 Operational Emission Sources

Operational characteristics of each source type determined the release parameters of each volume, line, area, or point source. The following identifies how source release parameters were determined:

- Ship Transiting (harbor, precautionary zone, and fairway transit segments): Emissions from ships in transit were simulated as a series of separated volume sources extending from the YTI terminal berths to the SCAB overwater boundary. Emissions associated with each transit segment were apportioned equally among the volume sources representing that segment.
- Ship Hoteling: Hoteling ships were modeled as stack point sources, located adjacent to each YTI berth.
- Ships at Anchorage: Occasionally, arriving ships are required to anchor temporarily inside the harbor for inspection or to await an open berth. Ships at anchorage were modeled as polygon area sources within the harbor.
- Tugboats: Emissions from tugboats assisting container ships were modeled as a series of separated volume sources extending from the YTI terminal berths to the Port breakwater.
- Locomotives: Emissions from locomotives were modeled as a series of separated volume sources positioned along rail lines used by switch and line haul locomotives. Based on the methodology in the Roseville Rail Yard Study, the volume source heights for locomotives in transit were set to different heights for daytime conditions compared to nighttime conditions (CARB, 2004).
- Container Trucks: Trucks driving and idling on the terminal were modeled as polygon area sources covering the areas of the terminal where truck activity would occur. Trucks driving off-site were modeled as line sources positioned along the major truck routes to and from the terminal.
- Cargo handling equipment: Cargo handling equipment was modeled as polygon area sources within the YTI terminal and TICTF. Emissions were spread uniformly over the polygons.
- TRUs: TRUs were modeled as polygon area sources within the TICTF. Emissions were spread uniformly over the polygons.
- Worker Vehicles: Worker vehicles driving on the terminal were modeled as polygon area sources covering the areas of the terminal where worker vehicles would drive and park. Worker vehicles driving off-site were modeled as line sources positioned along the major travel routes to and from the terminal.

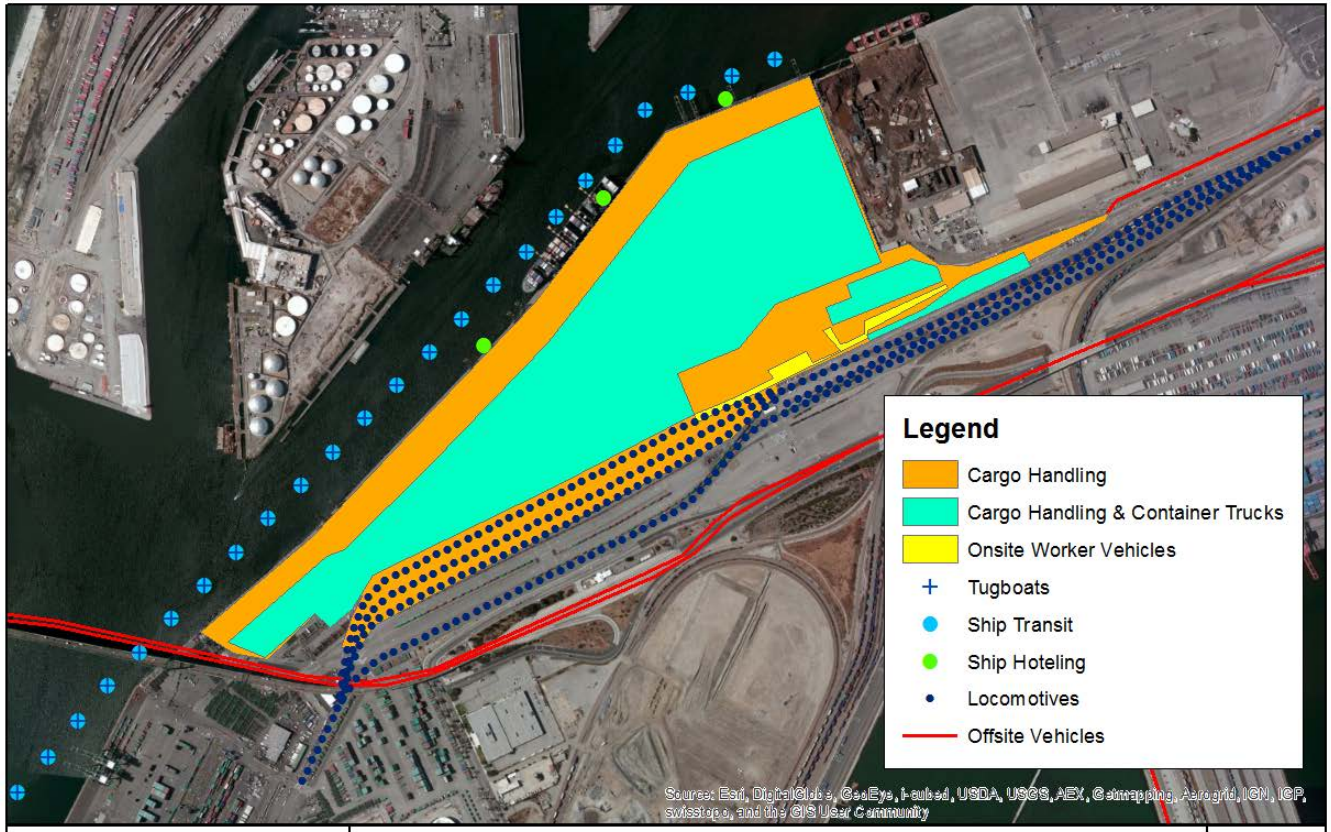
Emission sources were positioned using the Universal Transverse Mercator (UTM) coordinate system (NAD83) referenced to topographic data obtained from the US Geologic Survey (USGS). Table 3-2 presents the operational source parameters used in this analysis. Source locations are shown onFigure 3-1A/B.

Table 3-2. AERMOD Source Release Parameters – Operational Sources

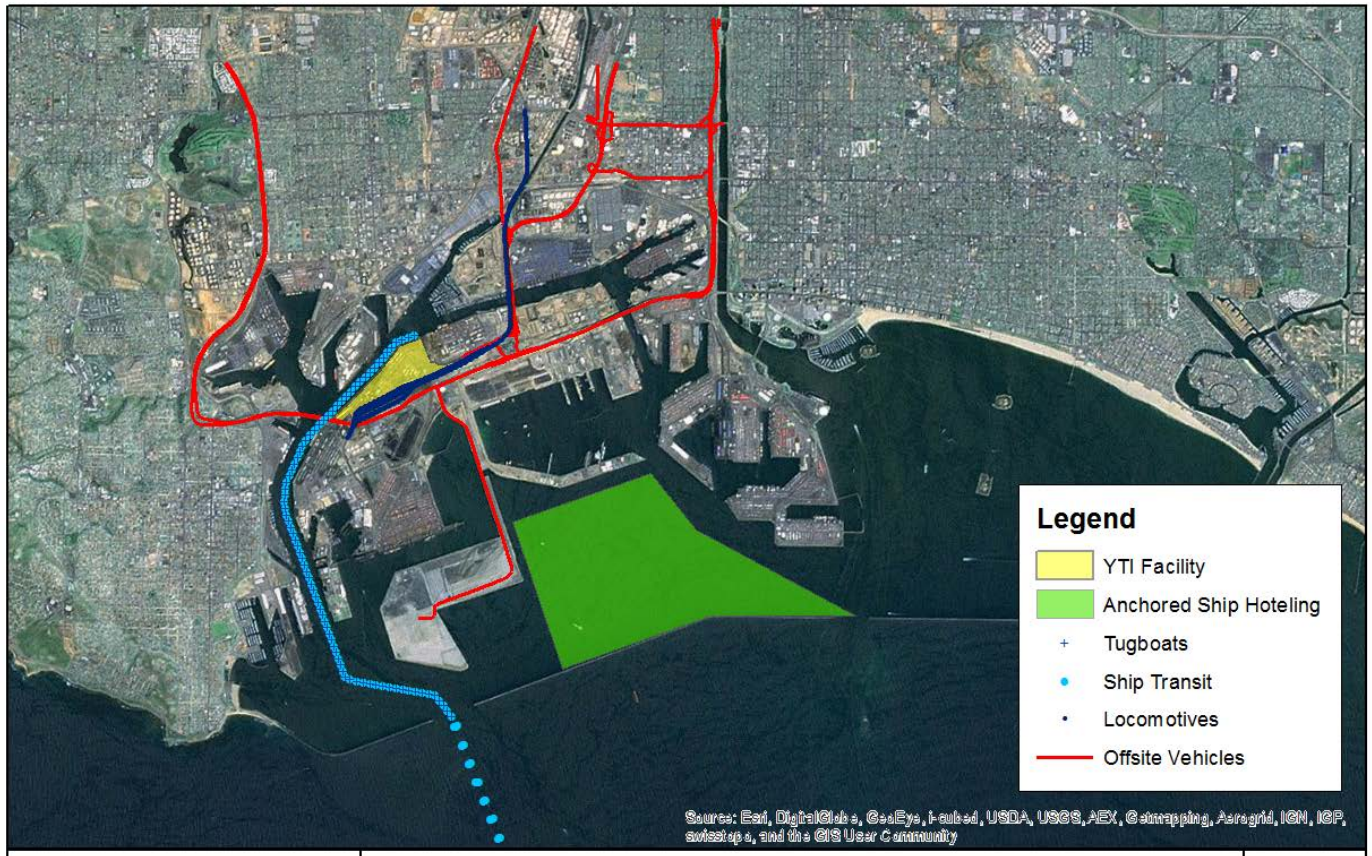
Source Description	AERMOD Source Type	Release Height (m)	Source Spacing (m)	Initial Vertical Dimension (m) [a]	Initial Horizontal Dimension (m) [h]	Exit Velocity (m/s)	Exit Temperature (K)	Stack Diameter (m)
Ship transit: propulsion engines, auxiliary engines, auxiliary boilers [b]	volume	59.13	100 in harbor	13.75	46.5			
		49.07	300 in precautionary zone	11.41	139.5	--	--	--
		49.07	1,000 in fairway	11.41	465.1	--	--	--
Ship hoteling: auxiliary engines [b]	point	44.01	--	--	--	7.7	578	0.47
Ship hoteling: boilers [b]	point	44.01	--	--	--	18.2	559	0.49
Ship hoteling at anchorage: auxiliary engines and boilers [b]	poly-area	44.01	--	10.23	--	--	--	--
Tugboats: propulsion and auxiliary engines [c]	volume	15.24	100	3.54	46.5	--	--	--
Locomotives transit: day (6am-6pm)	volume	5.6 d	50	2.60 [e]	23.3	--	--	--
Locomotives transit: night (6pm-6am)	volume	14.6 d	50	6.79 [e]	23.3	--	--	--
Container trucks: idling at in/out gate, driving on terminal [f]	poly-area	4.57	--	1.06	--	--	--	--
Container trucks transit offsite	line	4.57	--	1.06	--	--	--	--
Cargo handling equipment, TRUs [f]	poly-area	4.57	--	1.06	--	--	--	--
Worker vehicles onsite [g]	poly-area	0.61	--	1.06	--	--	--	--
Worker vehicles offsite	line	0.61	--	1.06	--	--	--	--

Notes:
a. The initial vertical dimension of the plume (σz) was estimated by dividing the initial vertical thickness by 4.3 for elevated releases and by 2.15 for ground-based releases.
b. Source of ship parameters: LAHD APL EIR/EIS for release height and China Shipping EIR/EIS for other parameters.
c. Source of tugboat parameters: LAHD APL EIR/EIS for release height.
d. Source of locomotive release height: Roseville Railyard Study, page G-3.
e. Source: Roseville Railyard Study divided source height by 2.15 (page 40).
f. Consistent with prior LAHD documents.
g. Source of worker vehicle parameters: Consistent with LAHD recommendations (LAHD 2012).
h. The initial horizontal dimension (σy) is the source spacing divided by a standard deviation of 2.15.

Figure 3-1A/B. YTI Container Terminal Source Locations



ENVIRON	Port of Los Angeles YTI Container Terminal Source Locations	Figure 3-1A



ENVIRON	Port of Los Angeles YTI Container Terminal Source Locations	Figure 3-1B

3.1.3 Meteorological Data

The dominant terrain features/water bodies that may influence wind patterns in this part of the Los Angeles Basin include the Pacific Ocean to the west, the hills of the Palos Verdes Peninsula to the west/southwest and the San Pedro Bay and shipping channels to the south of the study area. Although the area in the immediate vicinity of the Ports of Los Angeles (POLA or the Port) and Long Beach (POLB) is generally flat, these terrain features/water bodies may result in significant variations in wind patterns over relatively short distances (LAHD 2010). Attachment B2.2 presents a wind rose diagram showing how wind speed and direction are typically distributed in the vicinity of the proposed Project.

POLA and POLB currently operate monitoring stations that collect meteorological data from several locations within port boundaries. The data sets contain hourly observations of wind speed, wind direction, temperature, atmospheric stability, and mixing height recorded at each of the monitoring stations in the network. The meteorological data stations to the west of the Palos Verdes Hills and within approximately 5 kilometers of the San Pedro Bay generally exhibit predominant winds from the northwest and from the south or southeast. The consistency of the predominant winds among these stations indicates that the Palo Verdes Hills are channeling the winds from the northwest and that the San Pedro Bay and shipping channels influence the winds from the south and southeast (LAHD 2010).

For this dispersion analysis, the meteorological data collected at the Terminal Island Treatment Plant (TITP) was used for dispersion modeling. TITP is located just south of the YTI terminal on Pier 300, less than 0.5 miles from the center of the YTI terminal. The data used was collected between September 2006 and August 2007, and was processed and provided by ENVIRON (ENVIRON 2013).

The meteorological data were processed using the USEPA's approved AERMET (version 12345) meteorological data preprocessor for the AERMOD dispersion model. AERMET uses three steps to preprocess and combine the surface and upper-air soundings to output the data in a format which is compatible with the AERMOD model. The first step extracts the data and performs a brief quality assurance check of the data. The second step merges the meteorological data sets. The third step outputs the data in AERMOD-compatible format while also incorporating surface characteristics surrounding the collection or application site.

The output from the AERMET model consists of two separate files: the surface conditions file and a vertical profile dataset. AERMOD utilizes these two files in the dispersion modeling algorithm to predict pollutant concentrations resulting from a source's emissions.

As part of the effort to process the 2006-2007 meteorological data for the latest version of AERMOD (version 12345), the data were compared to the more recent meteorological data collected during years 2009 to 2012. It was determined that the 2006-2007 data period is representative in comparison to the 2009 to 2012 data period. To reach this conclusion, ENVIRON evaluated the completeness of the data by quarter, the average wind speed, and visually examined the wind pattern based on wind roses. The evaluation showed that the average wind speed and wind pattern of the original data period is very similar to that of the 2009 to 2012

data period across the stations at both POLA and POLB. Therefore it was concluded that the original data period is representative (ENVIRON 2013).

3.1.4 Model Options

Regulatory default technical options were selected for the AERMOD model. Use of these options follows the USEPA modeling guidance (USEPA, 2009; and 40 CFR, Appendix W; November 2005).

For NO_2 modeling, the non-default AERMOD Ozone Limiting Method (OLM) was used, consistent with the method used in a prior LAHD NEPA/CEQA document (LAHD 2011). With OLM, the nitrous oxide to nitrogen dioxide ($NO \rightarrow NO_2$) conversion rate is controlled by ambient ozone concentration. Hourly ozone measurements from the North Long Beach monitoring station were used as model input.

Receptor and source base elevations were determined from USGS National Elevation Dataset (NED) files using AERMAP, version 11103 (USEPA 2011). All coordinates were referenced to UTM NAD83, Zone 11.

3.1.5 Temporal Distribution Assumptions

For dispersion modeling purposes, construction and operational emissions were assumed to occur during the times specified in Table 3-3. Emissions were assumed to be uniformly distributed during the specific time periods described in the table. The temporal distribution assumptions are identical for the CEQA baseline, NEPA baseline, proposed Project, and project alternatives.

Table 3-3. Temporal Distribution of Emissions for CEQA Baseline, NEPA Baseline, Proposed Project and Alternatives

Source Description	Temporal Distribution
Construction-related sources on land [a]	7:00 am – 6:00 pm
Construction-related sources over water [a]	24 hours per day
Ships Hoteling	24 hours per day
Ships Transiting	24 hours per day
Tugboats assisting ships	24 hours per day
Container Trucks [b]	10 percent 6:00 am – 9:00 am 42 percent 9:00 am – 3:00 pm 18 percent 3:00 pm – 7:00 pm 30 percent 7:00 pm – 6:00 am
Locomotives	24 hours per day
Cargo Handling Equipment	7:00 am – 3:00 am
Transport Refrigeration Units	24 hours per day
Worker Trips [b]	23 percent 6:00 am – 9:00 am 29 percent 9:00 am – 3:00 pm 34 percent 3:00 pm – 7:00 pm 14 percent 7:00 pm – 6:00 am

Notes:
a. There is no construction for the CEQA baseline and Alternative 1.
b. The temporal distributions for container trucks and worker trips were derived from the traffic study.

3.1.6 Receptor Locations

To identify the extent and location of maximum impacts, two coarse Cartesian receptor grids were placed surrounding the project area, with receptors spaced 500 meters apart in each grid out to a distance of 5 km. The two grids were offset from one another by 250 meters in the north and east directions, creating a “honeycomb” grid pattern. Receptors were also placed around the property line at 100 meter intervals. On-site receptors were excluded from the analysis.

Figure 3-2 presents the coarse grid and fenceline receptors. To refine the locations of maximum impacts, fine receptor grids were placed around the property line and roadways. Receptors around the property were spaced 50 meters apart extending out to 250 meters. The fine grid receptors around the roadways were also spaced 50 meters apart, and extend out 100 meters along roadways and 250 meters at intersections.

Figure 3-2. YTI Container Terminal Coarse Grid and Fenceline Receptor Locations

ENVIRON	Port of Los Angeles YTI Container Terminal Receptor Locations	Figure 3-2

3.2 Concentration Significance Thresholds

Table 3-4 presents the SCAQMD significance thresholds used in the dispersion modeling analysis of criteria pollutant concentrations.

The significance thresholds for NO_2, SO_2, and CO are absolute thresholds based on the ambient air quality standards. This means that the highest modeled project concentrations must be added to the monitored ambient background concentrations to yield total concentrations for comparison to the thresholds. Ambient background concentrations were obtained from the Source-Dominated monitoring station, located at the TITP. Because this station is located very close to the project site, the background concentrations are presumed to include the impacts from existing YTI terminal operation. Therefore, to avoid double-counting the background concentration, the modeled project concentrations represent the change relative to existing YTI terminal operation (i.e., modeled project minus modeled 2012 YTI terminal operation). This approach, which was used in the determination of operational and combined construction and operational impacts, was endorsed by the SCAQMD (SCAQMD 2012a and SCAMQD 2012b). When construction-only impacts were modeled, the modeled project concentrations were directly added to the ambient background concentrations without subtracting 2012 YTI terminal operations, because the construction impacts were evaluated independently from YTI terminal operations.

The significance thresholds for PM_{10} and $PM_{2.5}$ are incremental thresholds. Therefore, the CEQA and NEPA impacts were determined by subtracting the modeled CEQA and NEPA baseline concentrations from the modeled project concentrations (i.e., project minus baseline) at each receptor. Because the thresholds are incremental, the background concentrations are not added to the incremental concentrations. Significance is determined by comparing the modeled receptor with the greatest increment to the thresholds. In the case of the CEQA increment for construction-only concentrations, the CEQA baseline is zero and therefore the CEQA increment is equivalent to the modeled project construction concentrations.

Table 3-4. SCAQMD Significance Thresholds for Ambient Air Quality Concentrations

Air Pollutant[a]	Ambient Concentration Threshold
Nitrogen Dioxide (NO_2)[b,c] 1-hour average (federal)[d] 1-hour average (state) Annual average (federal) Annual average (state)	 0.100 ppm (188 μg/m^3) (98th percentile) 0.18 ppm (338 μg/m^3) 0.0534 ppm (100 μg/m^3) 0.030 ppm (57 μg/m^3)
Sulfur Dioxide (SO_2)[b] 1-hour average (federal)[e] 1-hour average (state) 24-hour average	 0.075 ppm (197 μg/m^3) (99th percentile) 0.250 ppm (655 μg/m^3) 0.040 ppm (105 μg/m^3)
Carbon Monoxide (CO)[b] 1-hour average 8-hour average	 20 ppm (23,000 μg/m^3) 9.0 ppm (10,000 μg/m^3)
Inhalable Particulates (PM_{10})[f] 24-hour average 24-hour average Annual Average	 10.4 μg/m^3 (construction) 2.5 μg/m^3 (operation) 1.0 μg/m^3

Air Pollutant[a]	Ambient Concentration Threshold
Fine Particulates ($PM_{2.5}$) [f] 24-hour average 24-hour average	 10.4 µg/m^3 (construction) 2.5 µg/m^3 (operation)

Notes:

The SCAQMD has also established concentration thresholds for sulfates and lead. However, SCAQMD staff does not consider sulfates a pollutant of concern for port projects that do not involve sulfur piles, and therefore does not request dispersion modeling of sulfate emissions in NEPA/CEQA documents (SCAQMD 2011). Lead emissions would be negligible; thus concentration standards would not be exceeded.

The NO_2, SO_2, and CO thresholds are absolute thresholds; the maximum predicted impact from proposed Project and alternatives operations is added to the background concentration and compared to the threshold.

To evaluate Project impacts to ambient NO_2 levels, the analysis included the use of both the current SCAQMD NO_2 threshold (0.18 ppm) and the newer, more stringent 1-hour Federal ambient air quality standard (0.100 ppm). To attain the Federal standard, the 3-year average of the 98th percentile of the daily maximum 1-hour averages at a receptor must not exceed 0.100 ppm.

The Federal 1-hour average NO_2 concentration is based on the NAAQS because it is more stringent than the SCAQMD thresholds.

To attain the SO_2 federal 1-hour standard, the 3-year average of the 99th percentile of the daily maximum 1-hour averages at a receptor must not exceed 0.075 ppm.

The PM_{10} and $PM_{2.5}$ thresholds are incremental thresholds; the maximum predicted impact from construction activities (without adding the background concentration) is compared to these thresholds.

Sources: SCAQMD 2011, USEPA 2013.

3.3 Predicted Air Quality Impacts

3.3.1 Construction Impacts

Construction impacts were evaluated for the unmitigated and mitigated proposed Project, Alternative 2, and Alternative 3. Construction would not occur for Alternative 1.

3.3.1.1 Proposed Project

Table 3-5 and Table 3-6 summarize the AERMOD modeling results of unmitigated proposed Project construction emissions. The YTI terminal would continue to operate during construction of the proposed Project; construction and operational activities would overlap during this time. SCAQMD has requested that total proposed Project impacts be estimated during the period when construction and operational activities substantially overlap. Table 3-7 and Table 3-8 summarize the AERMOD modeling results of unmitigated proposed Project overlapping construction and operational emissions. NO_2, SO_2, and CO concentrations due to construction were added to background concentrations and compared to the SCAQMD thresholds. The AERMOD modeling results for PM_{10} and $PM_{2.5}$ represent the incremental increases due to the project and were compared directly to the SCAQMD thresholds without adding a background concentration.

Table 3-5 shows that the maximum off-site NO_2 (federal 1-hour, state 1-hour and state annual average) concentrations from construction activities would exceed SCAQMD thresholds. Table 3-6 shows that the maximum off-site incremental PM_{10} (24-hour and annual average) and $PM_{2.5}$ (24-hour average) concentrations from construction activities would exceed SCAQMD thresholds.

Table 3-7 shows that the maximum off-site NO_2 (federal 1-hour, state 1-hour and state annual average) concentrations from overlapping construction and operational activities would exceed SCAQMD thresholds. Table 3-8 shows that the maximum off-site incremental PM_{10} (24-hour and annual average) and $PM_{2.5}$ (24-hour average) concentrations from overlapping construction and operational activities would exceed SCAQMD thresholds.

Figure 3-3 shows the maximum air quality impact locations for the proposed Project construction. All of the maximum air quality impact locations are north of the project.

Figure 3-4 shows the maximum air quality impact locations for the proposed Project overlapping construction and operations. Most of the maximum air quality impact locations are also north of the project. Impacts less than zero (e.g. all the SO_2 maxima, as seen in Table 3-7) are an artifact of taking the maxima of proposed Project impacts, which are all less than zero at all receptors, and are not represented in the figures.

Table 3-5. Maximum Off-Site Ambient NO_2, SO_2, and CO Concentrations - Proposed Project Construction without Mitigation

Pollutant	Averaging Time	Background Concentration (µg/m^3)[c]	Maximum Modeled Project Concentration (µg/m^3)	Total Ground-Level Concentration (µg/m^3)[d]	SCAQMD Threshold (µg/m^3)	Concentration above threshold?
NO_2	Federal 1-hour[a]	164	1,031	1,195	188	Yes
	State 1-hour	190	1,154	1,344	338	Yes
	Federal annual	33	31	64	100	No
	State annual	33	31	64	57	Yes
SO_2	Federal 1-hour[b]	92	7	99	197	No
	State 1-hour	139	10	149	655	No
	24-hour	42	2	44	105	No
CO	1-hour	3,055	3,082	6,137	23,000	No
	8-hour	1,757	1,516	3,273	10,000	No

Notes:
a) The federal 1-hour NO2 modeled concentration represents the 98th percentile of the daily maximum 1-hour averages.
b) The federal 1-hour SO2 modeled concentration represents the 99th percentile of the daily maximum 1-hour averages.
c) The background concentrations for NO_2, SO_2 and CO were obtained from the TITP station.
d) Exceedances of the thresholds are indicated in bold.

Table 3-6. Maximum Off-Site Ambient PM_{10} and $PM_{2.5}$ Concentrations - Proposed Project Construction without Mitigation

Pollutant	Averaging Time	Maximum Modeled Concentration of Proposed Project (µg/m^3)	Maximum Modeled Concentration of CEQA Baseline (µg/m^3)	Maximum Modeled Concentration of NEPA Baseline (µg/m^3)	Ground-Level Concentration CEQA Increment (µg/m^3)[a,b]	Ground-Level Concentration NEPA Increment (µg/m3)[a,c]	SCAQMD Threshold (µg/m^3)	CEQA Concentration above threshold?	NEPA Concentration above threshold?
PM_{10}	24-hour	32.9	0	12.4	32.9	26.3	10.4	Yes	Yes
	Annual	1.4	0	0.3	1.4	1.4	1.0	Yes	Yes
$PM_{2.5}$	24-hour	29.4	0	3.5	29.4	26.7	10.4	Yes	Yes

Notes:
a) Exceedances of the threshold are indicated in bold. The thresholds for PM_{10} and $PM_{2.5}$ are incremental thresholds; therefore, the incremental concentration without background is compared to the threshold.
b) The CEQA increment represents project minus CEQA baseline. Because the CEQA baseline for construction is zero, the CEQA increment equals the maximum modeled concentration.
c) The NEPA increment represents project minus NEPA Baseline.
d) The maximum modeled project concentration, maximum modeled baseline concentrations, and maximum concentration increments may occur at different receptors. Therefore, the modeled project and baseline concentrations in the table may not necessarily subtract to equal the increment.

Table 3-7. Maximum Off-Site Ambient NO_2, SO_2, and CO Concentrations - Proposed Project Combined Construction and Operation without Mitigation

Pollutant	Averaging Time	Background Concentration (µg/m^3)[c]	Maximum Modeled Project Concentration Increment (µg/m^3)[d]	Total Ground-Level Concentration (µg/m^3)[e]	SCAQMD Threshold (µg/m^3)	Concentration above threshold?
NO_2	Federal 1-hour[a]	164	940	1,103	188	Yes
	State 1-hour	190	1040	1,230	338	Yes
	Federal annual	33	26	60	100	No
	State annual	33	26	60	57	Yes
SO_2	Federal 1-hour[b]	92	< 0	92	197	No
	State 1-hour	139	< 0	139	655	No
	24-hour	42	< 0	42	105	No
CO	1-hour	3,055	2,947	6,002	23,000	No
	8-hour	1,757	1,524	3,281	10,000	No

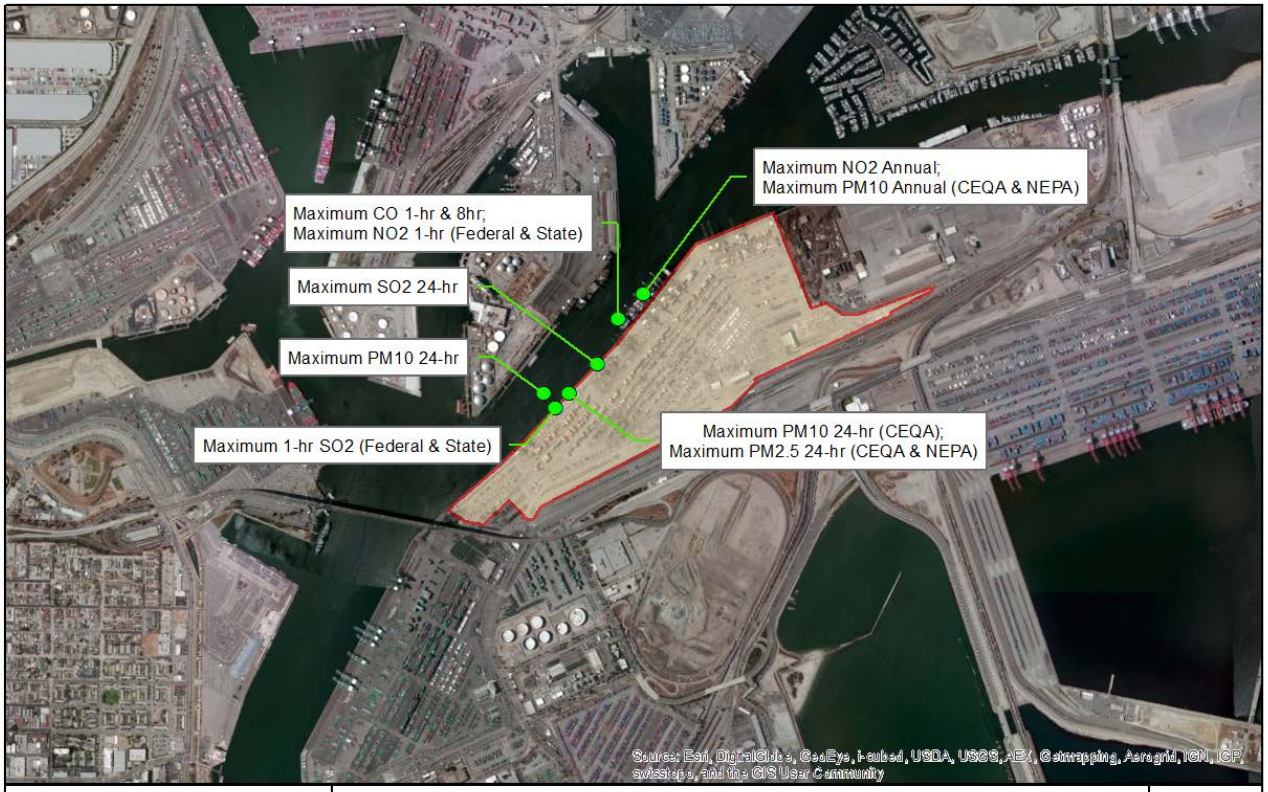
Notes:
a) The federal 1-hour NO2 modeled concentration represents the 98th percentile of the daily maximum 1-hour averages.
b) The federal 1-hour SO2 modeled concentration represents the 99th percentile of the daily maximum 1-hour averages.
c) The background concentrations for NO_2, SO_2 and CO were obtained from the TITP station.
d) The maximum modeled concentration increment represents Project construction plus operation minus 2012 terminal operations.
e) Exceedances of the thresholds are indicated in bold.

Table 3-8. Maximum Off-Site Ambient PM_{10} and $PM_{2.5}$ Concentrations - Proposed Project Combined Construction and Operation without Mitigation

Pollutant	Averaging Time	Maximum Modeled Concentration of Proposed Project (µg/m^3)	Maximum Modeled Concentration of CEQA Baseline (µg/m^3)	Maximum Modeled Concentration of NEPA Baseline (µg/m^3)	Ground-Level Concentration CEQA Increment (µg/m^3)[a,b]	Ground-Level Concentration NEPA Increment (µg/m^3)[a,c]	SCAQMD Threshold (µg/m^3)	CEQA Concentration above threshold?	NEPA Concentration above threshold?
PM_{10}	24-hour	36.7	22.7	35.5	29.8	25.7	10.4	Yes	Yes
	Annual	10.4	10.0	10.4	1.2	1.4	1.0	Yes	Yes
$PM_{2.5}$	24-hour	30.0	7.8	10.4	27.6	26.2	10.4	Yes	Yes

Notes:
a) Exceedances of the threshold are indicated in bold. The thresholds for PM_{10} and $PM_{2.5}$ are incremental thresholds; therefore, the incremental concentration without background is compared to the threshold.
b) The CEQA increment represents project minus CEQA baseline.
c) The NEPA increment represents project minus NEPA Baseline.
d) The maximum modeled project concentration, maximum modeled baseline concentrations, and maximum concentration increments may occur at different receptors. Therefore, the modeled project and baseline concentrations in the table may not necessarily subtract to equal the increment.

Figure 3-3. Maximum Air Quality Impact Locations – Proposed Project Construction without Mitigation



ENVIRON	Port of Los Angeles YTI Container Terminal Maximum Air Quality Impact Locations Proposed Project Construction without Mitigation	Figure 3-3

Figure 3-4. Maximum Air Quality Impact Locations – Proposed Project Combined Construction and Operation without Mitigation

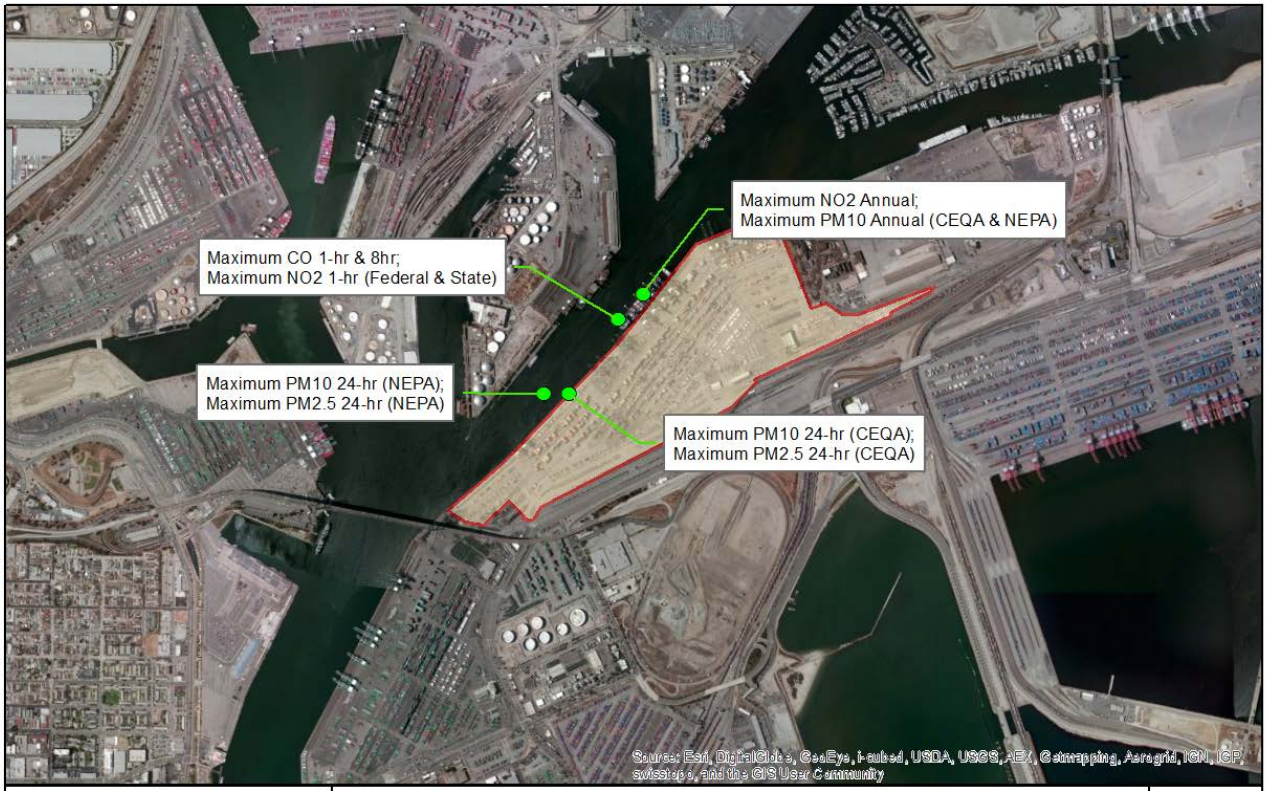


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Figure 3-4

Table 3-9 and Table 3-10 summarize the AERMOD modeling results of mitigated proposed Project construction emissions. Table 3-11 and Table 3-12 summarize the AERMOD modeling results of mitigated proposed Project overlapping construction and operational emissions.

Table 3-9 shows that the maximum off-site state annual NO_2 concentration from construction activities would be reduced below the threshold with mitigation. The federal and state 1-hour NO_2 concentrations would be reduced with mitigation but would remain above the thresholds. Table 3-10 shows that the maximum off-site incremental annual PM_{10} and 24-hour $PM_{2.5}$ concentrations from construction activities would be reduced below the thresholds with mitigation. The 24-hour PM_{10} concentration would be reduced with mitigation but would remain above the threshold.

Table 3-11 shows that the maximum off-site state annual NO_2 concentration from overlapping construction and operational activities would be reduced below the threshold with mitigation. The federal and state 1-hour NO_2 concentrations would be reduced with mitigation but would remain above the thresholds. Table 3-12 shows that the maximum off-site incremental annual PM_{10} and 24-hour $PM_{2.5}$ concentrations from overlapping construction and operational activities would be reduced below the thresholds with mitigation. The 24-hour PM_{10} concentration would be reduced with mitigation but would remain above the threshold.

Figure 3-5 shows the maximum air quality impact locations for the proposed Project construction with mitigation. The maximum air quality impact locations are directly north of the Project site.

Figure 3-6 shows the maximum air quality impact locations for the proposed Project overlapping construction and operations with mitigation. The maximum air quality impact locations are both north of the project, and in the south east corner of the project. Both maximum air quality impacts in the south east were located at fenceline receptors. Impacts less than zero (e.g. all the SO_2 maxima, as seen in Table 3-11) are an artifact of taking the maxima of proposed Project impacts, which are all less than zero at all receptors, and are not represented in the figures.

Table 3-9. Maximum Off-Site Ambient NO_2, SO_2, and CO Concentrations - Proposed Project Construction with Mitigation

Pollutant	Averaging Time	Background Concentration (µg/m^3)[c]	Maximum Modeled Project Concentration (µg/m^3)	Total Ground-Level Concentration (µg/m^3)[d]	SCAQMD Threshold (µg/m^3)	Concentration above threshold?
NO_2	Federal 1-hour[a]	164	473	636	188	Yes
	State 1-hour	190	537	727	338	Yes
	Federal annual	33	14	47	100	No
	State annual	33	14	47	57	No
SO_2	Federal 1-hour[b]	92	6	98	197	No
	State 1-hour	139	9	148	655	No
	24-hour	42	1	43	105	No
CO	1-hour	3,055	954	4,009	23,000	No
	8-hour	1,757	159	1,915	10,000	No

Notes:
a) The federal 1-hour NO2 modeled concentration represents the 98th percentile of the daily maximum 1-hour averages.
b) The federal 1-hour SO2 modeled concentration represents the 99th percentile of the daily maximum 1-hour averages.
c) The background concentrations for NO_2, SO_2 and CO were obtained from the TITP station.
d) Exceedances of the thresholds are indicated in bold.

Table 3-10. Maximum Off-Site Ambient PM_{10} and $PM_{2.5}$ Concentrations - Proposed Project Construction with Mitigation

Pollutant	Averaging Time	Maximum Modeled Concentration of Proposed Project (µg/m^3)	Maximum Modeled Concentration of CEQA Baseline (µg/m^3)	Maximum Modeled Concentration of NEPA Baseline (µg/m^3)	Ground-Level Concentration CEQA Increment (µg/m^3)[a,b]	Ground-Level Concentration NEPA Increment (µg/m^3)[a,c]	SCAQMD Threshold (µg/m^3)	CEQA Concentration above threshold?	NEPA Concentration above threshold?
PM_{10}	24-hour	13.7	0	12.4	13.7	3.3	10.4	Yes	No
	Annual	0.4	0	0.3	0.4	0.4	1.0	No	No
$PM_{2.5}$	24-hour	7.4	0	3.5	7.4	5.5	10.4	No	No

Notes:
a) Exceedances of the threshold are indicated in bold. The thresholds for PM_{10} and $PM_{2.5}$ are incremental thresholds; therefore, the incremental concentration without background is compared to the threshold.
b) The CEQA increment represents project minus CEQA baseline. Because the CEQA baseline for construction is zero, the CEQA increment equals the maximum modeled concentration.
c) The NEPA increment represents project minus NEPA Baseline.
d) The maximum modeled project concentration, maximum modeled baseline concentrations, and maximum concentration increments may occur at different receptors. Therefore, the modeled project and baseline concentrations in the table may not necessarily subtract to equal the increment.

Table 3-11. Maximum Off-Site Ambient NO_2, SO_2, and CO Concentrations - Proposed Project Combined Construction and Operation with Mitigation

Pollutant	Averaging Time	Background Concentration ($\mu g/m^3$)[c]	Maximum Modeled Project Concentration Increment ($\mu g/m^3$)[d]	Total Ground-Level Concentration ($\mu g/m^3$)[e]	SCAQMD Threshold ($\mu g/m^3$)	Concentration above threshold?
NO_2	Federal 1-hour[a]	164	381	545	188	Yes
	State 1-hour	190	418	608	338	Yes
	Federal annual	33	10	44	100	No
	State annual	33	10	44	57	No
SO_2	Federal 1-hour[b]	92	< 0	92	197	No
	State 1-hour	139	< 0	139	655	No
	24-hour	42	< 0	42	105	No
CO	1-hour	3,055	1,000	4,055	23,000	No
	8-hour	1,757	170	1,927	10,000	No

Notes:
a) The federal 1-hour NO2 modeled concentration represents the 98th percentile of the daily maximum 1-hour averages.
b) The federal 1-hour SO2 modeled concentration represents the 99th percentile of the daily maximum 1-hour averages.
c) The background concentrations for NO_2, SO_2 and CO were obtained from the TITP station.
d) The maximum modeled concentration increment represents Project construction plus operation minus 2012 terminal operations.
e) Exceedances of the thresholds are indicated in bold.

Table 3-12. Maximum Off-Site Ambient PM_{10} and $PM_{2.5}$ Concentrations - Proposed Project Combined Construction and Operation with Mitigation

Pollutant	Averaging Time	Maximum Modeled Concentration of Proposed Project ($\mu g/m^3$)	Maximum Modeled Concentration of CEQA Baseline ($\mu g/m^3$)	Maximum Modeled Concentration of NEPA Baseline ($\mu g/m^3$)	Ground-Level Concentration CEQA Increment ($\mu g/m^3$)[a,b]	Ground-Level Concentration NEPA Increment ($\mu g/m^3$)[a,c]	SCAQMD Threshold ($\mu g/m^3$)	CEQA Concentration above threshold?	NEPA Concentration above threshold?
PM_{10}	24-hour	36.1	22.7	35.5	13.7	2.7	10.4	Yes	No
	Annual	10.4	10.0	10.4	0.5	0.4	1.0	No	No
$PM_{2.5}$	24-hour	10.5	7.8	10.4	6.2	5.3	10.4	No	No

Notes:
a) Exceedances of the threshold are indicated in bold. The thresholds for PM_{10} and $PM_{2.5}$ are incremental thresholds; therefore, the incremental concentration without background is compared to the threshold.
b) The CEQA increment represents project minus CEQA baseline.
c) The NEPA increment represents project minus NEPA Baseline.
d) The maximum modeled project concentration, maximum modeled baseline concentrations, and maximum concentration increments may occur at different receptors. Therefore, the modeled project and baseline concentrations in the table may not necessarily subtract to equal the increment.

Figure 3-5. Maximum Air Quality Impact Locations – Proposed Project Construction with Mitigation

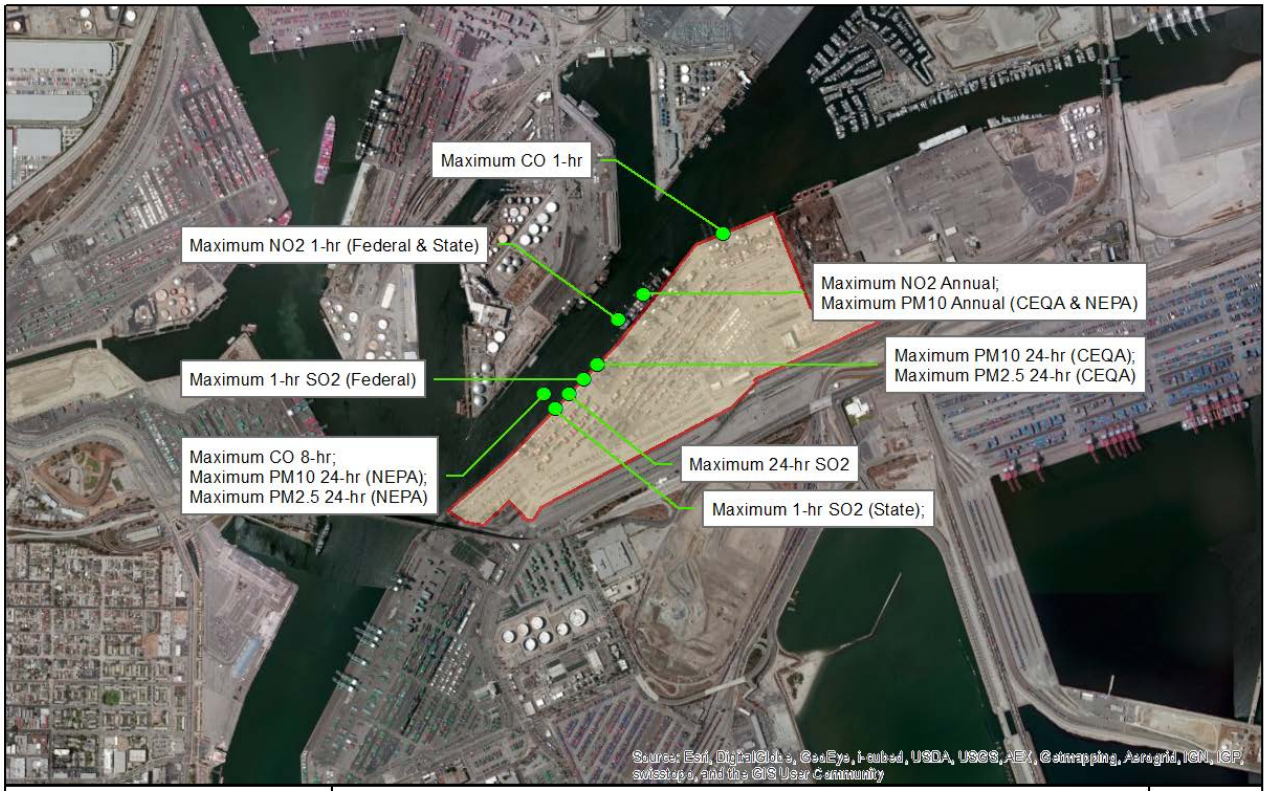

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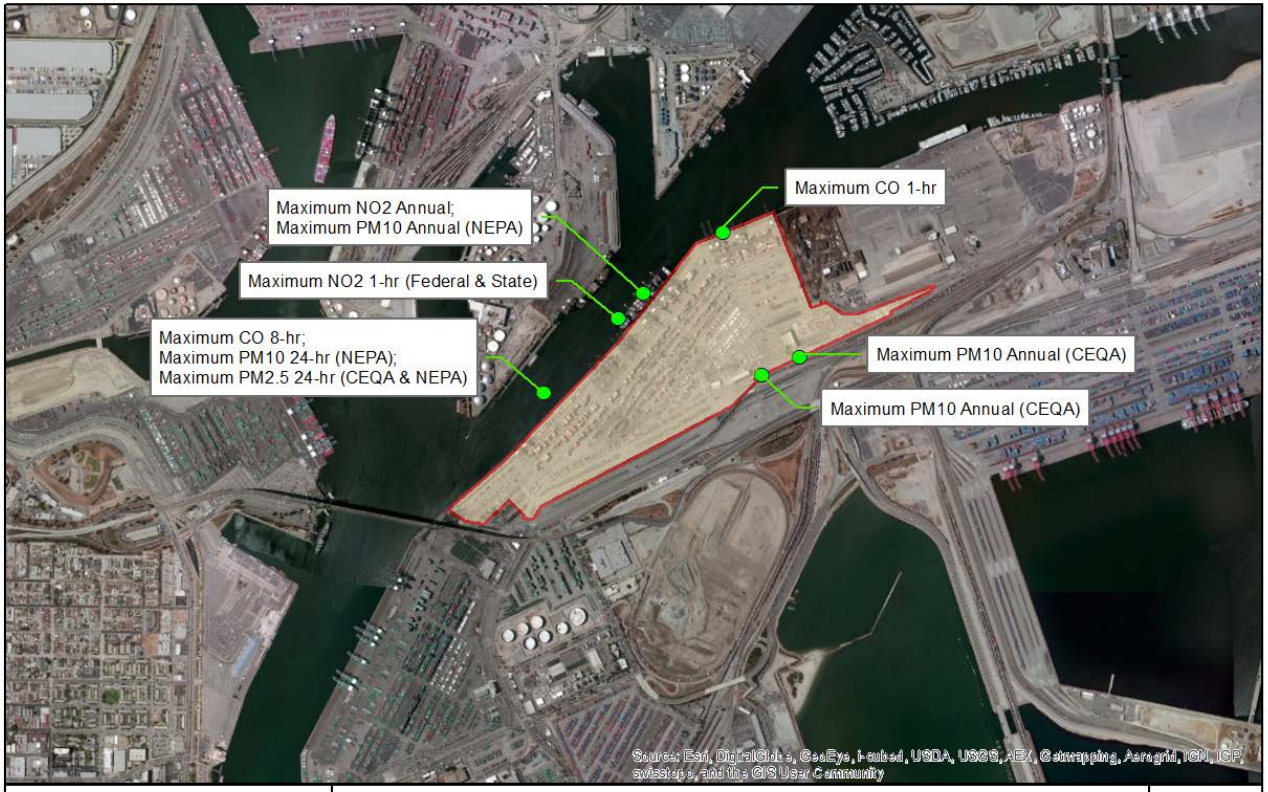
Figure 3-5

Figure 3-6. Maximum Air Quality Impact Locations – Proposed Project Combined Construction and Operation with Mitigation



ENVIRON	Port of Los Angeles YTI Container Terminal Maximum Air Quality Impact Locations Proposed Project Combined Construction and Operation with Mitigation	Figure 3-6

3.3.1.2 Alternative 1

Alternative 1 is the No Project Alternative. There would be no construction under Alternative 1.

3.3.1.3 Alternative 2

Alternative 2 is the No Federal Action Alternative and as such there would be no incremental difference between unmitigated Alternative 2 and the NEPA baseline. Table 3-13 and Table 3-14 summarize the AERMOD modeling results of unmitigated Alternative 2 construction emissions. The YTI terminal would continue to operate during construction of Alternative 2; construction and operational activities would overlap during this time. Table 3-15 and Table 3-16 summarize the AERMOD modeling results of Alternative 2 overlapping construction and operational emissions. NO_2, SO_2, and CO concentrations due to construction were added to background concentrations and compared to the SCAQMD thresholds. The AERMOD modeling result for PM_{10} and $PM_{2.5}$ represent the incremental increase due to the alternative and was compared directly to the SCAQMD thresholds without adding a background concentration.

Table 3-13 shows that the maximum off-site NO_2 (federal 1-hour and state 1-hour average) concentrations from construction activities would exceed the thresholds. Table 3-14 shows that the maximum off-site incremental PM_{10} (24-hour average) concentration would exceed the threshold.

Table 3-15 shows that the maximum off-site NO_2 (federal 1-hour average) concentration from overlapping construction and operational activities would exceed the threshold. Table 3-16 shows that the maximum off-site incremental PM_{10} (24-hour average) concentration from overlapping construction and operational activities would exceed the threshold. Figure 3-7 shows the maximum air quality impact locations for Alternative 2 construction without mitigation. For Alternative 2, all modeled maximum air quality impacts are located at fenceline receptors. Figure 3-8 shows the maximum air quality impact locations for Alternative 2 overlapping unmitigated construction and operations. The maximum air quality impacts are also located at fenceline receptors. Impacts less than zero (e.g. all the SO_2 maxima, as seen in Table 3-15) are an artifact of taking the maxima of Alternative 2 impacts, which are all less than zero at all receptors, and are not represented in the figures.

Table 3-13. Maximum Off-site Ambient NO_2, SO_2, and CO Concentrations – Alternative 2 Construction without Mitigation

Pollutant	Averaging Time	Background Concentration (µg/m^3)[c]	Maximum Modeled Alternative 2 Concentration (µg/m^3)	Total Ground-Level Concentration (µg/m^3)[d]	SCAQMD Threshold (µg/m^3)	Concentration above threshold?
NO_2	Federal 1-hour[a]	164	181	345	188	Yes
	State 1-hour	190	194	384	338	Yes
	Federal annual	33	4	37	100	No
	State annual	33	4	37	57	No
SO_2	Federal 1-hour[b]	92	0.4	92	197	No
	State 1-hour	139	0.5	139	655	No
	24-hour	42	0.1	42	105	No
CO	1-hour	3,055	176	3,231	23,000	No
	8-hour	1,757	43	1,799	10,000	No

Notes:
a) The federal 1-hour NO2 modeled concentration represents the 98th percentile of the daily maximum 1-hour averages.
b) The federal 1-hour SO2 modeled concentration represents the 99th percentile of the daily maximum 1-hour averages.
c) The background concentrations for NO_2, SO_2 and CO were obtained from the TITP station.
d) Exceedances of the thresholds are indicated in bold.

Table 3-14. Maximum Off-site Ambient PM_{10} and $PM_{2.5}$ Concentrations – Alternative 2 Construction without Mitigation

Pollutant	Averaging Time	Maximum Modeled Concentration of Alternative 2 (µg/m3)	Ground-Level Concentration CEQA Increment (µg/m3)a,b	SCAQMD Threshold (µg/m3)	CEQA Concentration above threshold?
PM10	24-hour	12.4	12.4	10.4	Yes
	Annual	0.3	0.3	1.0	No
PM2.5	24-hour	3.5	3.5	10.4	No

Notes:
a) Exceedances of the threshold are indicated in bold. The thresholds for PM10 and PM2.5 are incremental thresholds; therefore, the incremental concentration without background is compared to the threshold.
b) The CEQA increment represents project minus CEQA baseline. Because the CEQA baseline for construction is zero, the CEQA increment equals the maximum modeled concentration.

Table 3-15. Maximum Off-site Ambient NO_2, SO_2, and CO Concentrations – Alternative 2 Construction and Operation without Mitigation

Pollutant	Averaging Time	Background Concentration (µg/m3)c	Maximum Modeled Alternative 2 Concentration Increment (µg/m3)d	Total Ground-Level Concentration (µg/m3)e	SCAQMD Threshold (µg/m3)	Concentration above threshold?
NO2	Federal 1-houra	164	31	195	188	Yes
	State 1-hour	190	46	236	338	No
	Federal annual	33	3	36	100	No
	State annual	33	3	36	57	No
SO2	Federal 1-hourb	92	< 0	92	197	No
	State 1-hour	139	< 0	139	655	No
	24-hour	42	< 0	42	105	No
CO	1-hour	3,055	227	3,282	23,000	No
	8-hour	1,757	63	1,820	10,000	No

Notes:
a) The federal 1-hour NO2 modeled concentration represents the 98th percentile of the daily maximum 1-hour averages.
b) The federal 1-hour SO2 modeled concentration represents the 99th percentile of the daily maximum 1-hour averages.
c) The background concentrations for NO2, SO2 and CO were obtained from the TITP station.
d) The maximum modeled concentration increment represents Alternative 2 construction plus operation minus 2012 terminal operations.
e) Exceedances of the thresholds are indicated in bold.

Table 3-16. Maximum Off-site Ambient PM_{10} and $PM_{2.5}$ Concentrations – Alternative 2 Construction and Operation without Mitigation

Pollutant	Averaging Time	Maximum Modeled Concentration of Alternative 2 (µg/m3)	Maximum Modeled Concentration of CEQA Baseline (µg/m3)	Maximum Modeled Concentration of NEPA Baseline (µg/m3)	Ground-Level Concentration CEQA Increment (µg/m3)a,b	Ground-Level Concentration NEPA Increment (µg/m3)a,c	SCAQMD Threshold (µg/m3)	CEQA Concentration above threshold?
PM10	24-hour	35.5	22.7	35.5	13.0	0	10.4	Yes
	Annual	10.4	10.0	10.4	0.5	0	1.0	No
PM2.5	24-hour	10.4	7.8	10.4	2.7	0	10.4	No

Notes:
a) Exceedances of the threshold are indicated in bold. The thresholds for PM10 and PM2.5 are incremental thresholds; therefore, the incremental concentration without background is compared to the threshold.
b) The CEQA increment represents project minus CEQA baseline.
c) The NEPA increment represents project minus NEPA Baseline.
d) The maximum modeled Alternative 2 concentration, maximum modeled baseline concentrations, and maximum concentration increments may occur at different receptors. Therefore, the modeled Alternative 2 and baseline concentrations in the table may not necessarily subtract to equal the increment.

Figure 3-7. Maximum Air Quality Impact Locations – Alternative 2 Construction without Mitigation

ENVIRON	Port of Los Angeles YTI Container Terminal Maximum Air Quality Impact Locations Alternative 2: Construction without Mitigation	Figure 3-7

Figure 3-8. Maximum Air Quality Impact Locations – Alternative 2 Combined Construction and Operation without Mitigation

ENVIRON	Port of Los Angeles YTI Container Terminal Maximum Air Quality Impact Locations Alternative 2: Combined Construction and Operation without Mitigation	Figure 3-8

Table 3-17 and Table 3-18 summarize the AERMOD modeling results of mitigated Alternative 2 construction emissions.

Table 3-19 and Table 3-20 summarize the AERMOD modeling results of mitigated Alternative 2 overlapping construction and operational emissions.

Table 3-17 shows that the maximum off-site NO_2 (federal 1-hour and state 1-hour average) concentrations from construction activities would be reduced with mitigation but would remain above the thresholds. Table 3-18 shows that the maximum off-site incremental PM_{10} (24-hour average) concentration from construction activities would be reduced with mitigation but would remain above the threshold.

Table 3-19 shows that the maximum off-site NO_2 concentrations from overlapping construction and operational activities would be reduced below the thresholds with mitigation. Table 3-20 shows that the maximum off-site incremental PM_{10} (24-hour average) concentration from overlapping construction and operational activities would be reduced with mitigation but would remain above the threshold.

Figure 3-9 shows the maximum air quality impact locations for Alternative 2 construction with mitigation. For Alternative 2 with mitigation, the maximum air quality impact locations are all at fenceline receptors. Figure 3-10 shows the maximum air quality impact locations for Alternative 2 overlapping construction and operations with mitigation. Impacts less than zero (e.g. all the SO2 maxima, as seen in Table 3-19) are an artifact of taking the maxima of Alternative 2 impacts, which are all less than zero at all receptors, and are not represented in the figures.

Table 3-17. Maximum Off-site Ambient NO_2, SO_2, and CO Concentrations – Alternative 2 Construction with Mitigation

Pollutant	Averaging Time	Background Concentration (µg/m^3)[c]	Maximum Modeled Alternative 2 Concentration (µg/m^3)	Total Ground-Level Concentration (µg/m^3)[d]	SCAQMD Threshold (µg/m^3)	Concentration above threshold?
NO_2	Federal 1-hour[a]	164	128	292	188	Yes
	State 1-hour	190	154	344	338	Yes
	Federal annual	33	4	37	100	No
	State annual	33	4	37	57	No
SO_2	Federal 1-hour[b]	92	0.4	92	197	No
	State 1-hour	139	0.5	139	655	No
	24-hour	42	0.1	42	105	No
CO	1-hour	3,055	134	3,189	23,000	No
	8-hour	1,757	37	1,793	10,000	No

Notes:
a) The federal 1-hour NO2 modeled concentration represents the 98th percentile of the daily maximum 1-hour averages.
b) The federal 1-hour SO2 modeled concentration represents the 99th percentile of the daily maximum 1-hour averages.
c) The background concentrations for NO_2, SO_2 and CO were obtained from the TITP station.
d) Exceedances of the thresholds are indicated in bold.

Table 3-18. Maximum Off-site Ambient PM_{10} and $PM_{2.5}$ Concentrations – Alternative 2 Construction with Mitigation

Pollutant	Averaging Time	Maximum Modeled Concentration of Alternative 2 (µg/m^3)	Ground-Level Concentration CEQA Increment (µg/m^3)[a,b]	SCAQMD Threshold (µg/m^3)	CEQA Concentration above threshold?
PM_{10}	24-hour	11.9	11.9	10.4	Yes
	Annual	0.3	0.3	1.0	No
$PM_{2.5}$	24-hour	3.0	3.0	10.4	No

Notes:
a) Exceedances of the threshold are indicated in bold. The thresholds for PM_{10} and $PM_{2.5}$ are incremental thresholds; therefore, the incremental concentration without background is compared to the threshold.
b) The CEQA increment represents project minus CEQA baseline. Because the CEQA baseline for construction is zero, the CEQA increment equals the maximum modeled concentration.

Table 3-19. Maximum Off-site Ambient NO_2, SO_2, and CO Concentrations – Alternative 2 Construction and Operation with Mitigation

Pollutant	Averaging Time	Background Concentration (µg/m^3)[c]	Maximum Modeled Alternative 2 Concentration Increment (µg/m^3)[d]	Total Ground-Level Concentration (µg/m^3)[e]	SCAQMD Threshold (µg/m^3)	Concentration above threshold?
NO_2	Federal 1-hour[a]	164	22	185	188	No
	State 1-hour	190	30	220	338	No
	Federal annual	33	3	36	100	No
	State annual	33	3	36	57	No
SO_2	Federal 1-hour[b]	92	< 0	92	197	No
	State 1-hour	139	< 0	139	655	No
	24-hour	42	< 0	42	105	No
CO	1-hour	3,055	185	3,240	23,000	No
	8-hour	1,757	53	1,810	10,000	No

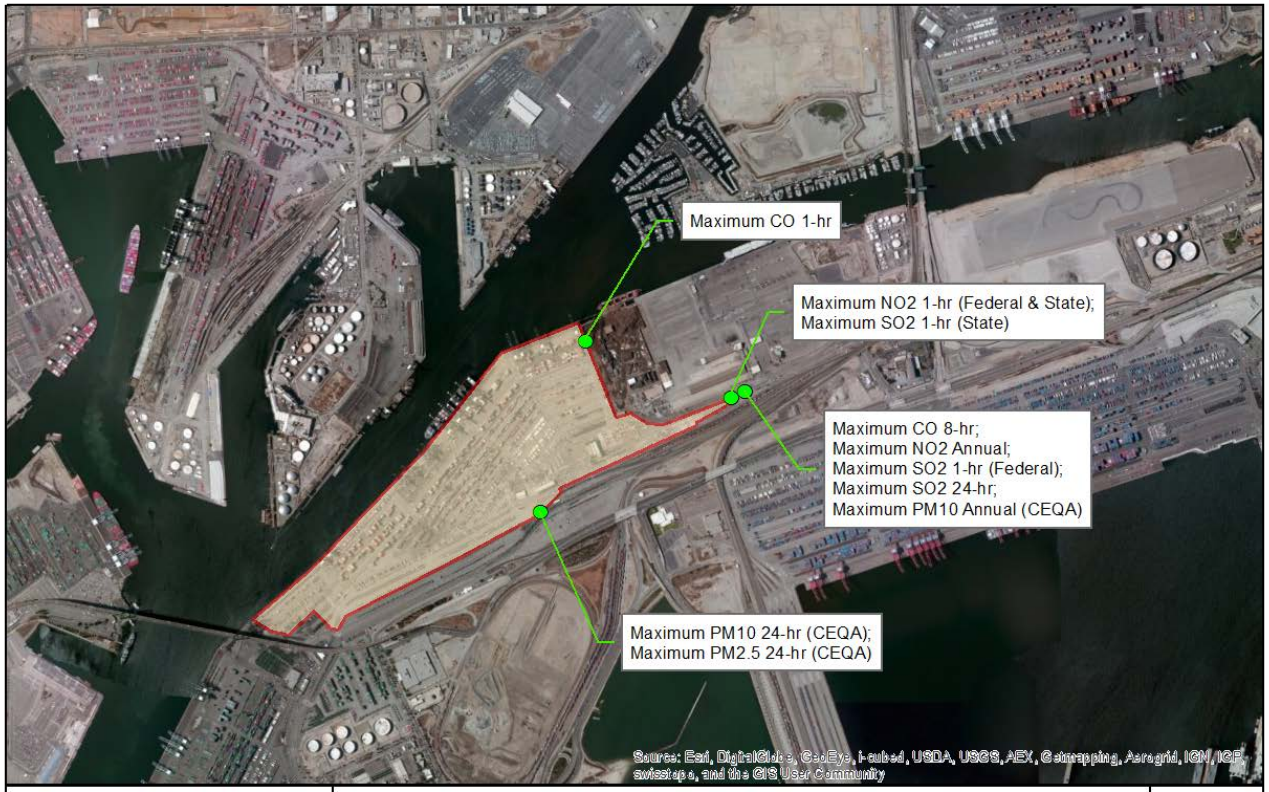
Notes:
a) The federal 1-hour NO2 modeled concentration represents the 98th percentile of the daily maximum 1-hour averages.
b) The federal 1-hour SO2 modeled concentration represents the 99th percentile of the daily maximum 1-hour averages.
c) The background concentrations for NO_2, SO_2 and CO were obtained from the TITP station.
d) The maximum modeled concentration increment represents Alternative 2 construction plus operation minus 2012 terminal operations.
e) Exceedances of the thresholds are indicated in bold.

Table 3-20. Maximum Off-site Ambient PM_{10} and $PM_{2.5}$ Concentrations – Alternative 2 Construction and Operation with Mitigation

Pollutant	Averaging Time	Maximum Modeled Concentration of Alternative 2 (µg/m^3)	Maximum Modeled Concentration of CEQA Baseline (µg/m^3)	Maximum Modeled Concentration of NEPA Baseline (µg/m^3)	Ground-Level Concentration CEQA Increment (µg/m^3)[a,b]	Ground-Level Concentration NEPA Increment (µg/m^3)[a,c]	SCAQMD Threshold (µg/m^3)	CEQA Concentration above threshold?
PM_{10}	24-hour	35.0	22.7	35.0	12.5	0	10.4	Yes
	Annual	10.4	10.0	10.4	0.5	0	1.0	No
$PM_{2.5}$	24-hour	10.0	7.8	10.0	2.3	0	10.4	No

Notes:
a) Exceedances of the threshold are indicated in bold. The thresholds for PM_{10} and $PM_{2.5}$ are incremental thresholds; therefore, the incremental concentration without background is compared to the threshold.
b) The CEQA increment represents project minus CEQA baseline.
c) The NEPA increment represents project minus NEPA Baseline.
d) The maximum modeled Alternative 2 concentration, maximum modeled baseline concentrations, and maximum concentration increments may occur at different receptors. Therefore, the modeled Alternative 2 and baseline concentrations in the table may not necessarily subtract to equal the increment.

Figure 3-9. Maximum Air Quality Impact Locations – Alternative 2 Construction with Mitigation



ENVIRON	Port of Los Angeles YTI Container Terminal Maximum Air Quality Impact Locations Alternative 2: Construction with Mitigation	Figure 3-9

Figure 3-10. Maximum Air Quality Impact Locations – Alternative 2 Combined Construction and Operation with Mitigation

ENVIRON	Port of Los Angeles YTI Container Terminal Maximum Air Quality Impact Locations Alternative 2: Combined Construction and Operation with Mitigation	Figure 3-10

3.3.1.4 Alternative 3

Table 3-21 and Table 3-22 summarize the AERMOD modeling results of unmitigated Alternative 3 construction emissions. The YTI terminal would continue to operate during construction of Alternative 3; construction and operational activities would overlap during this time.

Table 3-23 and Table 3-24 summarize the AERMOD modeling results of unmitigated Alternative 3 overlapping construction and operational emissions.

Table 3-21 shows that the maximum off-site NO_2 (federal 1-hour, state 1-hour and state annual average) concentrations from construction activities would exceed the thresholds. Table 3-22 shows that the maximum off-site incremental PM_{10} (24-hour and annual average) and $PM_{2.5}$ (24-hour) concentrations from construction activities would exceed the thresholds.

Table 3-23 shows that the maximum off-site NO_2 (federal 1-hour and state 1-hour average) concentrations from overlapping construction and operational activities would exceed the thresholds. Table 3-24 shows that the maximum off-site incremental PM_{10} (24-hour and annual average) and $PM_{2.5}$ (24-hour average) concentrations from overlapping construction and operational activities would exceed the thresholds.

Figure 3-11 shows the maximum air quality impact locations for Alternative 3 construction. The locations of maximum air quality impact shown in this figure are north of the Project.

Figure 3-12 shows the maximum air quality impact locations for Alternative 3 overlapping construction and operations. Impacts less than zero (e.g. all the SO2 maxima, as seen in Table 3-23) are an artifact of taking the maxima of Alternative 3 impacts, which are all less than zero at all receptors, and are not represented in the figures.

Table 3-21. Maximum Off-site Ambient NO_2, SO_2, and CO Concentrations – Alternative 3 Construction without Mitigation

Pollutant	Averaging Time	Background Concentration (µg/m^3)[c]	Maximum Modeled Alternative 3 Concentration (µg/m^3)	Total Ground-Level Concentration (µg/m^3)[d]	SCAQMD Threshold (µg/m^3)	Concentration above threshold?
NO_2	Federal 1-hour[a]	164	659	823	188	Yes
	State 1-hour	190	727	917	338	Yes
	Federal annual	33	28	61	100	No
	State annual	33	28	61	57	Yes
SO_2	Federal 1-hour[b]	92	7	99	197	No
	State 1-hour	139	10	149	655	No
	24-hour	42	2	44	105	No
CO	1-hour	3,055	1,760	4,815	23,000	No
	8-hour	1,757	1,016	2,773	10,000	No

Notes:
a) The federal 1-hour NO2 modeled concentration represents the 98th percentile of the daily maximum 1-hour averages.
b) The federal 1-hour SO2 modeled concentration represents the 99th percentile of the daily maximum 1-hour averages.
c) The background concentrations for NO_2, SO_2 and CO were obtained from the TITP station.
d) Exceedances of the thresholds are indicated in bold.

Table 3-22. Maximum Off-site Ambient PM_{10} and $PM_{2.5}$ Concentrations –Alternative 3 Construction without Mitigation

Pollutant	Averaging Time	Maximum Modeled Concentration of Alternative 3 (µg/m^3)	Maximum Modeled Concentration of CEQA Baseline (µg/m^3)	Maximum Modeled Concentration of NEPA Baseline (µg/m^3)	Ground-Level Concentration CEQA Increment (µg/m^3)[a,b]	Ground-Level Concentration NEPA Increment (µg/m^3)[a,c]	SCAQMD Threshold (µg/m^3)	CEQA Concentration above threshold?	NEPA Concentration above threshold?
PM_{10}	24-hour	33.2	0	12.4	33.2	26.4	10.4	Yes	Yes
	Annual	1.2	0	0.3	1.2	1.2	1.0	Yes	Yes
$PM_{2.5}$	24-hour	29.4	0	3.5	29.4	26.7	10.4	Yes	Yes

Notes:
a) Exceedances of the threshold are indicated in bold. The thresholds for PM_{10} and $PM_{2.5}$ are incremental thresholds; therefore, the incremental concentration without background is compared to the threshold.
b) The CEQA increment represents project minus CEQA baseline. Because the CEQA baseline for construction is zero, the CEQA increment equals the maximum modeled concentration.
c) The NEPA increment represents project minus NEPA Baseline.
d) The maximum modeled Alternative 3 concentration, maximum modeled baseline concentrations, and maximum concentration increments may occur at different receptors. Therefore, the modeled Alternative 3 and baseline concentrations in the table may not necessarily subtract to equal the increment.

Table 3-23. Maximum Off-site Ambient NO_2, SO_2, and CO Concentrations – Alternative 3 Construction and Operation without Mitigation

Pollutant	Averaging Time	Background Concentration (µg/m^3)[c]	Maximum Modeled Alternative 3 Concentration Increment (µg/m^3)[d]	Total Ground-Level Concentration (µg/m^3)[e]	SCAQMD Threshold (µg/m^3)	Concentration above threshold?
NO_2	Federal 1-hour[a]	164	581	745	188	Yes
	State 1-hour	190	632	822	338	Yes
	Federal annual	33	23	56	100	No
	State annual	33	23	56	57	No
SO_2	Federal 1-hour[b]	92	< 0	92	197	No
	State 1-hour	139	< 0	139	655	No
	24-hour	42	< 0	42	105	No
CO	1-hour	3,055	1,748	4,803	23,000	No
	8-hour	1,757	1,028	2,784	10,000	No

Notes:
a) The federal 1-hour NO2 modeled concentration represents the 98th percentile of the daily maximum 1-hour averages.
b) The federal 1-hour SO2 modeled concentration represents the 99th percentile of the daily maximum 1-hour averages.
c) The background concentrations for NO_2, SO_2 and CO were obtained from the TITP station.
d) The maximum modeled concentration increment represents Alternative 3 construction plus operation minus 2012 terminal operations.
e) Exceedances of the thresholds are indicated in bold.

Table 3-24. Maximum Off-site Ambient PM_{10} and $PM_{2.5}$ Concentrations –Alternative 3 Construction and Operation without Mitigation

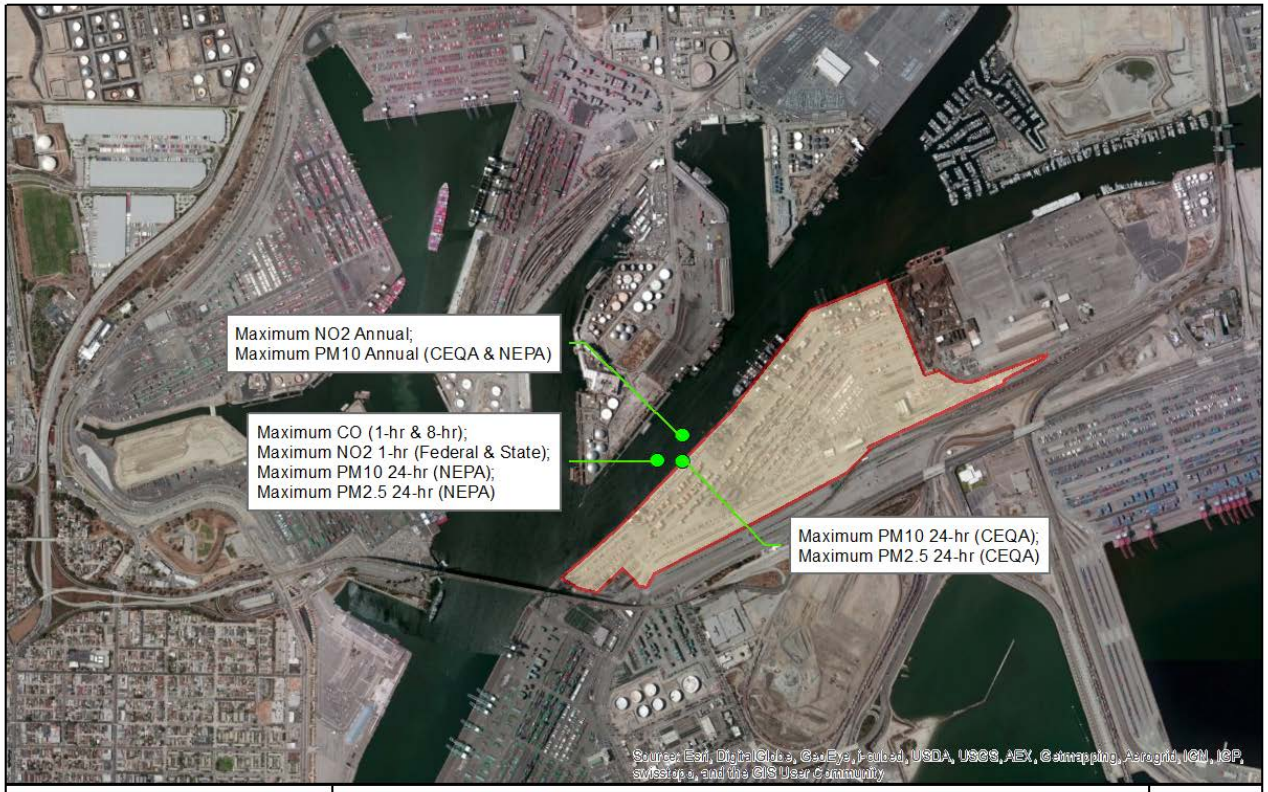
Pollutant	Averaging Time	Maximum Modeled Concentration of Alternative 3 (µg/m^3)	Maximum Modeled Concentration of CEQA Baseline (µg/m^3)	Maximum Modeled Concentration of NEPA Baseline (µg/m^3)	Ground-Level Concentration CEQA Increment (µg/m^3)[a,b]	Ground-Level Concentration NEPA Increment (µg/m^3)[a,c]	SCAQMD Threshold (µg/m^3)	CEQA Concentration above threshold?	NEPA Concentration above threshold?
PM_{10}	24-hour	36.6	22.7	35.5	30.1	25.8	10.4	Yes	Yes
	Annual	10.4	10.0	10.4	1.1	1.2	1.0	Yes	Yes
$PM_{2.5}$	24-hour	30.1	7.8	10.4	27.7	26.2	10.4	Yes	Yes

Notes:
a) Exceedances of the threshold are indicated in bold. The thresholds for PM_{10} and $PM_{2.5}$ are incremental thresholds; therefore, the incremental concentration without background is compared to the threshold.
b) The CEQA increment represents project minus CEQA baseline.
c) The NEPA increment represents project minus NEPA Baseline.
d) The maximum modeled Alternative 3 concentration, maximum modeled baseline concentrations, and maximum concentration increments may occur at different receptors. Therefore, the modeled Alternative 3 and baseline concentrations in the table may not necessarily subtract to equal the increment.

Figure 3-11. Maximum Air Quality Impact Locations – Alternative 3 Construction without Mitigation

ENVIRON	Port of Los Angeles YTI Container Terminal Maximum Air Quality Impact Locations Alternative 3: Construction without Mitigation	Figure 3-11

Figure 3-12. Maximum Air Quality Impact Locations – Alternative 3 Combined Construction and Operation without Mitigation



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Port of Los Angeles
YTI Container Terminal
Maximum Air Quality Impact Locations
Alternative 3: Combined Construction and Operation without Mitigation

Figure 3-12

Table 3-25 and Table 3-26 summarize the AERMOD modeling results of mitigated Alternative 3 construction emissions. Table 3-27 and Table 3-28 summarize the AERMOD modeling results of mitigated Alternative 3 overlapping construction and operational emissions.

Table 3-25 shows that the maximum off-site NO_2 (federal 1-hour and state 1-hour average) concentrations from construction activities would be reduced with mitigation but would remain above the thresholds. The maximum state annual NO_2 concentration would be reduced below the threshold with mitigation. Table 3-26 shows that the maximum off-site incremental PM_{10} (24-hour average) concentration from construction activities would be reduced with mitigation but would remain above the threshold. The maximum annual PM_{10} and 24-hour $PM_{2.5}$ concentrations would be reduced below the thresholds with mitigation.

Table 3-27 shows that the maximum off-site NO_2 (federal 1-hour and state 1-hour average) concentrations from overlapping construction and operational activities would be reduced with mitigation but would remain above the thresholds. Table 3-28 shows that the maximum off-site incremental PM_{10} (24-hour average) concentration from overlapping construction and operational activities would be reduced with mitigation but would remain above the threshold. The maximum annual PM_{10} and 24-hour $PM_{2.5}$ concentrations would be reduced below the thresholds.

Figure 3-13 shows the maximum air quality impact locations for Alternative 3 construction with mitigation. Similar to the results obtained for the construction without mitigation AERMOD model maximum air quality impacts are located directly north of the Project site.

Figure 3-14 shows the maximum air quality impact locations for Alternative 3 overlapping construction and operations with mitigation. Impacts less than zero (e.g. all the SO_2 maxima, as seen in Table 3-27) are an artifact of taking the maxima of Alternative 3 impacts, which are all less than zero at all receptors, and are not represented in the figures.

Table 3-25. Maximum Off-site Ambient NO_2, SO_2, and CO Concentrations – Alternative 3 Construction with Mitigation

Pollutant	Averaging Time	Background Concentration (µg/m^3)[c]	Maximum Modeled Alternative 3 Concentration (µg/m^3)	Total Ground-Level Concentration (µg/m^3)[d]	SCAQMD Threshold (µg/m^3)	Concentration above threshold?
NO_2	Federal 1-hour[a]	164	264	428	188	Yes
	State 1-hour	190	344	534	338	Yes
	Federal annual	33	12	45	100	No
	State annual	33	12	45	57	No
SO_2	Federal 1-hour[b]	92	6	98	197	No
	State 1-hour	139	9	148	655	No
	24-hour	42	1	43	105	No
CO	1-hour	3,055	904	3,959	23,000	No
	8-hour	1,757	159	1,915	10,000	No

Notes:
a) The federal 1-hour NO2 modeled concentration represents the 98th percentile of the daily maximum 1-hour averages.
b) The federal 1-hour SO2 modeled concentration represents the 99th percentile of the daily maximum 1-hour averages.
c) The background concentrations for NO_2, SO_2 and CO were obtained from the TITP station.
d) Exceedances of the thresholds are indicated in bold.

Table 3-26. Maximum Off-site Ambient PM_{10} and $PM_{2.5}$ Concentrations –Alternative 3 Construction with Mitigation

Pollutant	Averaging Time	Maximum Modeled Concentration of Alternative 3 (µg/m^3)	Maximum Modeled Concentration of CEQA Baseline (µg/m^3)	Maximum Modeled Concentration of NEPA Baseline (µg/m^3)	Ground-Level Concentration CEQA Increment (µg/m^3)[a,b]	Ground-Level Concentration NEPA Increment (µg/m^3)[a,c]	SCAQMD Threshold (µg/m^3)	CEQA Concentration above threshold?	NEPA Concentration above threshold?
PM_{10}	24-hour	13.0	0	12.4	13.0	3.4	10.4	Yes	No
	Annual	0.4	0	0.3	0.4	0.4	1.0	No	No
$PM_{2.5}$	24-hour	7.5	0	3.5	7.5	5.5	10.4	No	No

Notes:
a) Exceedances of the threshold are indicated in bold. The thresholds for PM_{10} and $PM_{2.5}$ are incremental thresholds; therefore, the incremental concentration without background is compared to the threshold.
b) The CEQA increment represents project minus CEQA baseline. Because the CEQA baseline for construction is zero, the CEQA increment equals the maximum modeled concentration.
c) The NEPA increment represents project minus NEPA Baseline.
d) The maximum modeled Alternative 3 concentration, maximum modeled baseline concentrations, and maximum concentration increments may occur at different receptors. Therefore, the modeled Alternative 3 and baseline concentrations in the table may not necessarily subtract to equal the increment.

Table 3-27. Maximum Off-site Ambient NO_2, SO_2, and CO Concentrations – Alternative 3 Construction and Operation with Mitigation

Pollutant	Averaging Time	Background Concentration (µg/m^3)[c]	Maximum Modeled Alternative 3 Concentration Increment (µg/m^3)[d]	Total Ground-Level Concentration (µg/m^3)[e]	SCAQMD Threshold (µg/m^3)	Concentration above threshold?
NO_2	Federal 1-hour[a]	164	190	354	188	Yes
	State 1-hour	190	241	431	338	Yes
	Federal annual	33	9	43	100	No
	State annual	33	9	43	57	No
SO_2	Federal 1-hour[b]	92	< 0	92	197	No
	State 1-hour	139	< 0	139	655	No
	24-hour	42	< 0	42	105	No
CO	1-hour	3,055	920	3,975	23,000	No
	8-hour	1,757	170	1,927	10,000	No

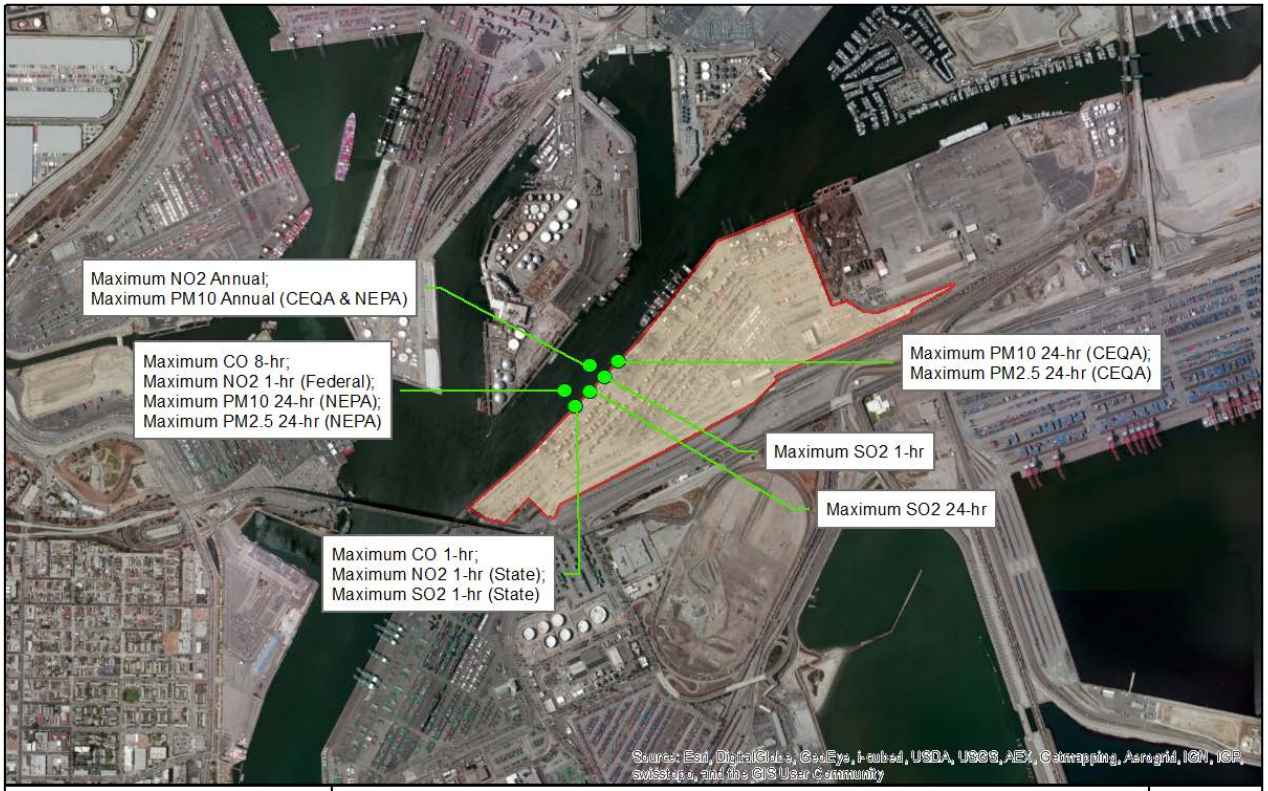
Notes:
a) The federal 1-hour NO2 modeled concentration represents the 98th percentile of the daily maximum 1-hour averages.
b) The federal 1-hour SO2 modeled concentration represents the 99th percentile of the daily maximum 1-hour averages.
c) The background concentrations for NO_2, SO_2 and CO were obtained from the TITP station.
d) The maximum modeled concentration increment represents Alternative 3 construction plus operation minus 2012 terminal operations.
e) Exceedances of the thresholds are indicated in bold.

Table 3-28. Maximum Off-site Ambient PM_{10} and $PM_{2.5}$ Concentrations –Alternative 3 Construction and Operation with Mitigation

Pollutant	Averaging Time	Maximum Modeled Concentration of Alternative 3 (µg/m^3)	Maximum Modeled Concentration of CEQA Baseline (µg/m^3)	Maximum Modeled Concentration of NEPA Baseline (µg/m^3)	Ground-Level Concentration CEQA Increment (µg/m^3)[a,b]	Ground-Level Concentration NEPA Increment (µg/m^3)[a,c]	SCAQMD Threshold (µg/m^3)	CEQA Concentration above threshold?	NEPA Concentration above threshold?
PM_{10}	24-hour	36.0	22.7	35.5	13.5	2.8	10.4	Yes	No
	Annual	10.4	10.0	10.4	0.5	0.4	1.0	No	No
$PM_{2.5}$	24-hour	10.3	7.8	10.4	6.2	5.4	10.4	No	No

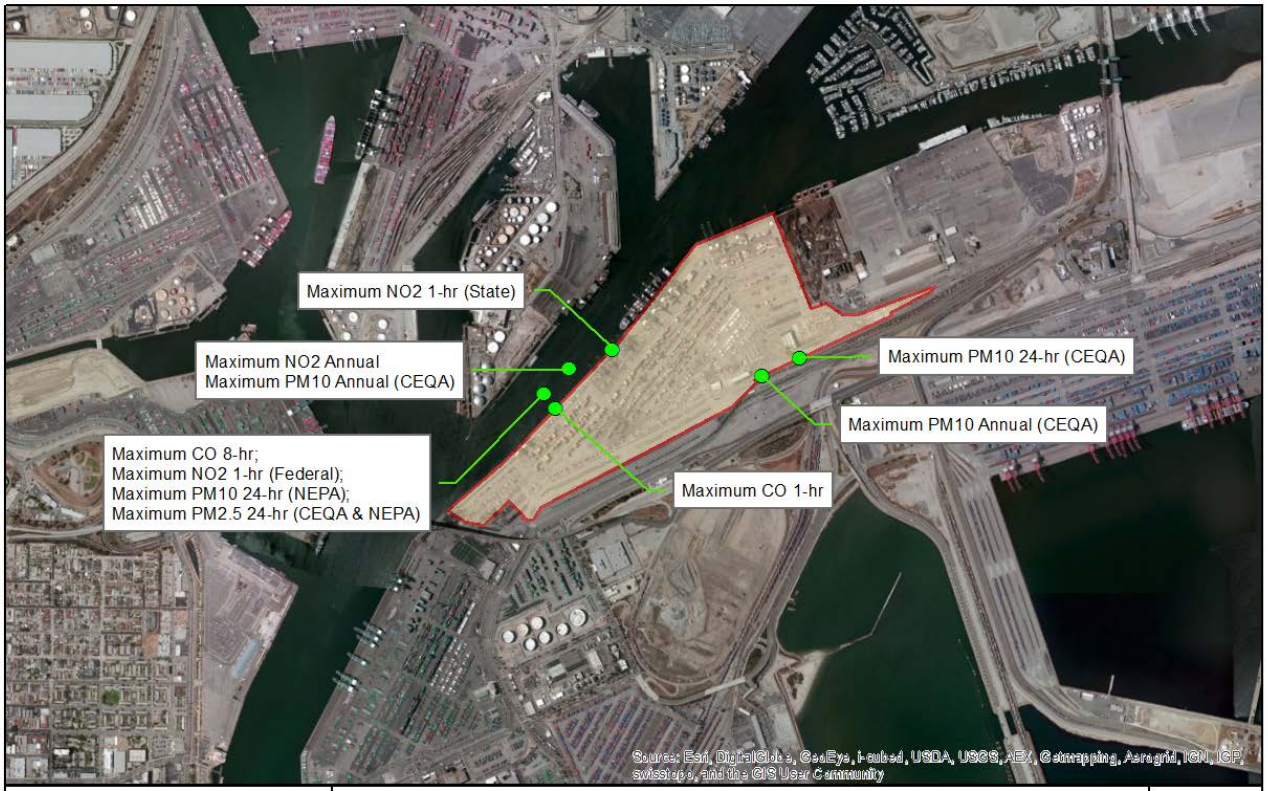
Notes:
a) Exceedances of the threshold are indicated in bold. The thresholds for PM_{10} and $PM_{2.5}$ are incremental thresholds; therefore, the incremental concentration without background is compared to the threshold.
b) The CEQA increment represents project minus CEQA baseline.
c) The NEPA increment represents project minus NEPA Baseline.
d) The maximum modeled Alternative 3 concentration, maximum modeled baseline concentrations, and maximum concentration increments may occur at different receptors. Therefore, the modeled Alternative 3 and baseline concentrations in the table may not necessarily subtract to equal the increment.

Figure 3-13. Maximum Air Quality Impact Locations – Alternative 3 Construction with Mitigation



ENVIRON	Port of Los Angeles YTI Container Terminal Maximum Air Quality Impact Locations Alternative 3: Construction with Mitigation	Figure 3-13

Figure 3-14. Maximum Air Quality Impact Locations – Alternative 3 Combined Construction and Operation with Mitigation



ENVIRON	Port of Los Angeles YTI Container Terminal Maximum Air Quality Impact Locations Alternative 3: Combined Construction and Operation with Mitigation	Figure 3-14

3.3.2 Operational Impacts

Operational impacts were evaluated for the CEQA baseline; the NEPA baseline; the unmitigated Alternative 1; and the unmitigated and mitigated proposed Project, Alternative 2, and Alternative 3. Mitigation is not required under Alternative 1.

3.3.2.1 Proposed Project

Table 3-29 and Table 3-30 summarize the AERMOD modeling results of unmitigated proposed Project operational emissions. NO_2, SO_2, and CO concentrations due to operation were added to background concentrations and compared to the SCAQMD thresholds. The AERMOD modeling results for PM_{10} and $PM_{2.5}$ represent the incremental increases due to the project relative to the CEQA and NEPA baselines and were compared directly to the SCAQMD thresholds without adding a background concentration.

Table 3-29 shows that the maximum off-site NO_2 (federal 1-hour average) concentration from operational activities would exceed the threshold. Table 3-30 shows that the maximum off-site incremental PM_{10} (24-hour and annual average) concentrations from operational activities would exceed the threshold.

Table 3-31 shows the source contributions at the location of the maximum modeled concentration of the unmitigated proposed Project for the pollutants and averaging periods that were determined to exceed thresholds. Emissions from locomotives, vehicles (worker vehicles and trucks) within the Project boundary, cargo handling equipment, and ocean-going vessels (OGV) contribute significantly to the maximum modeled concentrations of the criteria pollutants that exceed thresholds.

Figure 3-15 shows the maximum air quality impact locations for the proposed Project operation without mitigation. The maximum air quality impacts are located on the Project fenceline receptors or in close proximity to the Project. Impacts less than zero (e.g. all the SO_2 maxima, as seen in Table 3-29) are an artifact of taking the maxima of proposed Project impacts, which are all less than zero at all receptors, and are not represented in the figure.

Table 3-29. Maximum Off-site NO_2, SO_2, and CO Concentrations - Proposed Project Operation without Mitigation

Pollutant	Averaging Time	Background Concentration ($\mu g/m^3$)[c]	Maximum Modeled Project Concentration Increment ($\mu g/m^3$)[d]	Total Ground-Level Concentration ($\mu g/m^3$)[e]	SCAQMD Threshold ($\mu g/m^3$)	Concentration above threshold?
NO_2	Federal 1-hour[a]	164	36	200	188	Yes
	State 1-hour	190	43	233	338	No
	Federal annual	33	5	38	100	No
	State annual	33	5	38	57	No
SO_2	Federal 1-hour[b]	92	< 0	92	197	No
	State 1-hour	139	< 0	139	655	No
	24-hour	42	< 0	42	105	No
CO	1-hour	3,055	205	3,260	23,000	No
	8-hour	1,757	141	1,897	10,000	No

Notes:
a) The federal 1-hour NO2 modeled concentration represents the 98th percentile of the daily maximum 1-hour averages.
b) The federal 1-hour SO2 modeled concentration represents the 99th percentile of the daily maximum 1-hour averages.
c) The background concentrations for NO_2, SO_2 and CO were obtained from the TITP station.
d) The maximum modeled concentration increment represents Project operation minus 2012 terminal operations.
e) Exceedances of the thresholds are indicated in bold.

Table 3-30. Maximum Off-site PM_{10} and $PM_{2.5}$ Concentrations - Proposed Project Operation without Mitigation

Pollutant	Averaging Time	Maximum Modeled Concentration of Proposed Project ($\mu g/m^3$)	Maximum Modeled Concentration of CEQA Baseline ($\mu g/m^3$)	Maximum Modeled Concentration of NEPA Baseline ($\mu g/m^3$)	Ground-Level Concentration CEQA Increment ($\mu g/m^3$)[a,b]	Ground-Level Concentration NEPA Increment ($\mu g/m^3$)[a,c]	SCAQMD Threshold ($\mu g/m^3$)	CEQA Concentration above threshold?	NEPA Concentration above threshold?
PM_{10}	24-hour	34.0	22.7	30.6	11.6	3.6	2.5	Yes	Yes
	Annual	14.6	10.0	13.2	4.5	1.3	1.0	Yes	Yes
$PM_{2.5}$	24-hour	9.8	7.8	8.8	2.1	1.1	2.5	No	No

Notes:
a) Exceedances of the threshold are indicated in bold. The thresholds for PM_{10} and $PM_{2.5}$ are incremental thresholds; therefore, the incremental concentration without background is compared to the threshold.
b) The CEQA increment represents project minus CEQA baseline.
c) The NEPA increment represents project minus NEPA Baseline.
d) The maximum modeled project concentration, maximum modeled baseline concentrations, and maximum concentration increments may occur at different receptors. Therefore, the modeled project and baseline concentrations in the table may not necessarily subtract to equal the increment.

Table 3-31. Source Contributions at the Maximum Modeled Concentration – Proposed Project Operation without Mitigation

Emission Source Group	NO_2 (1-hour federal)[a]	NO_2 (1-hour state)	NO_2 (annual)	PM_{10} (24-hour)	PM_{10} (annual)	$PM_{2.5}$ (24-hour)
Locomotives	60.65%	49.19%	26.34%	1.37%	1.93%	4.37%
Trucks Out Gate	12.65%	15.86%	16.10%	< 1.0%	< 1.0%	< 1.0%
OGV Transit Zone 1	10.51%	13.27%	< 1.0%	< 1.0%	< 1.0%	< 1.0%
Trucks Onsite	6.27%	4.46%	25.63%	75.53%	84.23%	67.11%
Cargo Handling Equipment	5.04%	10.30%	17.63%	1.93%	< 1.0%	5.99%
OGV Hotelling Auxiliary Engine	2.77%	2.05%	1.50%	< 1.0%	< 1.0%	2.64%
Onsite Worker Vehicle Exhaust	< 1.0%	< 1.0%	< 1.0%	19.35%	12.32%	17.29%
Trucks In Gate	< 1.0%	1.95%	9.19%	< 1.0%	< 1.0%	< 1.0%
Tugboats Assist During Operation	< 1.0%	< 1.0%	1.12%	< 1.0%	< 1.0%	< 1.0%
Other Source Categories[b]	< 3.0%	< 3.0%	< 3.0%	< 3.0%	< 3.0%	< 3.0%

Notes:
a) The federal 1-hour NO2 modeled concentration represents the 98th percentile of the daily maximum 1-hour averages.
b) These source categories include Offsite Autos, Offsite Trucks, OGV Anchorage, OGV Hotelling Boiler, OGV Transit Zones 2 through 5, and TRUs. Each of these contribute less than 1% individually.

Figure 3-15. Maximum Air Quality Impact Locations – Proposed Project Operation without Mitigation

ENVIRON	Port of Los Angeles YTI Container Terminal Maximum Air Quality Impact Locations Proposed Project Operation without Mitigation	Figure 3-15

Table 3-32 and Table 3-33 summarize the AERMOD modeling results of mitigated proposed Project operational emissions. Table 3-32 shows that the maximum off-site NO_2 (federal 1-hour average) concentration from operational activities would not be substantially reduced with mitigation and would remain above the threshold. Table 3-33 shows that the maximum off-site incremental PM_{10} (24-hour and annual average) concentrations from operational activities would also not be substantially reduced with mitigation and would remain above the thresholds. Table 3-34 shows the source contributions at the location of the maximum modeled concentration of the mitigated proposed Project for the pollutants and averaging periods that were determined to exceed thresholds. The source contributions results are very similar to the results for the proposed Project operation without mitigation shown in Table 3-31.

Figure 3-16 shows the maximum air quality impact locations for the proposed Project operation with mitigation. The maximum impact locations are the same as the proposed Project operation without mitigation.

Table 3-32. Maximum Off-site NO_2, SO_2 and CO Concentrations - Proposed Project Operation with Mitigation

Pollutant	Averaging Time	Background Concentration (µg/m^3)[c]	Maximum Modeled Project Concentration Increment (µg/m^3)[d]	Total Ground-Level Concentration (µg/m^3)[e]	SCAQMD Threshold (µg/m^3)	Concentration above threshold?
NO_2	Federal 1-hour[a]	164	36	200	188	Yes
	State 1-hour	190	43	233	338	No
	Federal annual	33	5	38	100	No
	State annual	33	5	38	57	No
SO_2	Federal 1-hour[b]	92	< 0	92	197	No
	State 1-hour	139	< 0	139	655	No
	24-hour	42	< 0	42	105	No
CO	1-hour	3,055	205	3,260	23,000	No
	8-hour	1,757	141	1,897	10,000	No

Notes:
a) The federal 1-hour NO2 modeled concentration represents the 98th percentile of the daily maximum 1-hour averages.
b) The federal 1-hour SO2 modeled concentration represents the 99th percentile of the daily maximum 1-hour averages.
c) The background concentrations for NO_2, SO_2 and CO were obtained from the TITP station.
d) The maximum modeled concentration increment represents Project operation minus 2012 terminal operations.
e) Exceedances of the thresholds are indicated in bold.

Table 3-33. Maximum Off-site PM_{10} and $PM_{2.5}$ Concentrations - Proposed Project Operation with Mitigation

Pollutant	Averaging Time	Maximum Modeled Concentration of Proposed Project (µg/m^3)	Maximum Modeled Concentration of CEQA Baseline (µg/m^3)	Maximum Modeled Concentration of NEPA Baseline (µg/m^3)	Ground-Level Concentration CEQA Increment (µg/m^3)[a,b]	Ground-Level Concentration NEPA Increment (µg/m^3)[a,c]	SCAQMD Threshold (µg/m^3)	CEQA Concentration above threshold?	NEPA Concentration above threshold?
PM_{10}	24-hour	34.0	22.7	30.6	11.6	3.6	2.5	Yes	Yes
	Annual	14.6	10.0	13.2	4.5	1.3	1.0	Yes	Yes
$PM_{2.5}$	24-hour	9.8	7.8	8.8	2.1	1.1	2.5	No	No

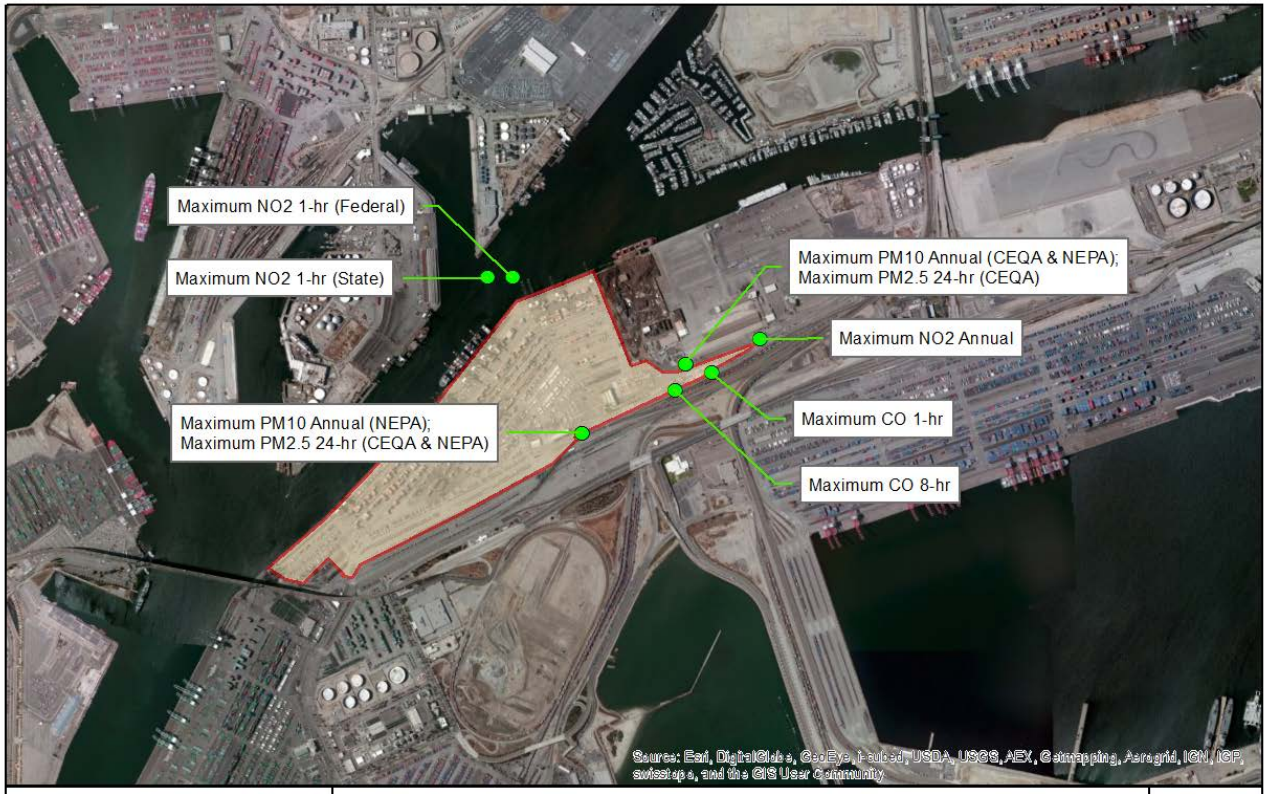
Notes:
a) Exceedances of the threshold are indicated in bold. The thresholds for PM_{10} and $PM_{2.5}$ are incremental thresholds; therefore, the incremental concentration without background is compared to the threshold.
b) The CEQA increment represents project minus CEQA baseline.
c) The NEPA increment represents project minus NEPA Baseline.
d) The maximum modeled project concentration, maximum modeled baseline concentrations, and maximum concentration increments may occur at different receptors. Therefore, the modeled project and baseline concentrations in the table may not necessarily subtract to equal the increment.

Table 3-34. Source Contributions at the Maximum Modeled Concentration – Proposed Project Operation with Mitigation

Emission Source	NO_2 (1-hour federal)[a]	NO_2 (1-hour state)	NO_2 (annual)	PM_{10} (24-hour)	PM_{10} (annual)	$PM_{2.5}$ (24-hour)
Locomotives	60.69%	49.23%	26.34%	1.37%	1.93%	4.37%
Trucks Out Gate	12.66%	15.88%	16.10%	< 1.0%	< 1.0%	< 1.0%
OGV Transit Zone 1	10.52%	13.28%	< 1.0%	< 1.0%	< 1.0%	< 1.0%
Trucks Onsite	6.28%	4.47%	25.63%	75.53%	84.23%	67.12%
Cargo Handling Equipment	5.05%	10.31%	17.63%	1.93%	< 1.0%	5.99%
OGV Hotelling Auxiliary Engine	2.77%	2.05%	1.50%	< 1.0%	< 1.0%	2.63%
Onsite Worker Vehicle Exhaust	< 1.0%	< 1.0%	< 1.0%	19.35%	12.32%	17.29%
Trucks In Gate	< 1.0%	1.95%	9.19%	< 1.0%	< 1.0%	< 1.0%
Tugboats Assist During Operation	< 1.0%	< 1.0%	1.12%	< 1.0%	< 1.0%	< 1.0%
Other Source Categories[b]	< 3.0%	< 3.0%	< 3.0%	< 3.0%	< 3.0%	< 3.0%

Notes:
a) The federal 1-hour NO2 modeled concentration represents the 98th percentile of the daily maximum 1-hour averages.
b) These source categories include Offsite Autos, Offsite Trucks, OGV Anchorage, OGV Hotelling Boiler, OGV Transit Zones 2 through 5, and TRUs. Each of these contribute less than 1% individually.

Figure 3-16. Maximum Air Quality Impact Locations – Proposed Project Operation with Mitigation



ENVIRON	Port of Los Angeles YTI Container Terminal Maximum Air Quality Impact Locations Proposed Project Operation with Mitigation	Figure 3-16

3.3.2.2 Alternative 1

Table 3-35 and Table 3-36 summarize the AERMOD modeling results of unmitigated Alternative 1 operational emissions. NO_2, SO_2, and CO concentrations due to operation were added to background concentrations and compared to the SCAQMD thresholds. The AERMOD modeling results for PM_{10} and $PM_{2.5}$ represent the incremental increases due to the alternative and were compared directly to the SCAQMD thresholds without adding a background concentration.

Table 3-35 shows that the maximum off-site NO_2 (federal 1-hour average) concentration from operational activities would exceed the threshold. Table 3-36 shows that the maximum off-site incremental PM_{10} (24-hour and annual average) concentrations from operational activities would exceed the thresholds. Mitigation is not required for Alternative 1 because Alternative 1 is the No Project Alternative.

There are no major differences in relative emission source group contributions between the proposed Project and all project Alternatives. Therefore, the source contributions at the locations of the maximum modeled concentration for Alternative 1 are expected to be similar to those shown for the proposed Project operation in Table 3-31. Figure 3-17 shows the maximum air quality impact locations for Alternative 1 operation. Impacts less than zero (e.g. all the SO_2 maxima, as seen in Table 3-35) are an artifact of taking the maxima of Alternative 1 impacts, which are all less than zero at all receptors, and are not represented in the figure.

Table 3-35. Maximum Off-site NO_2, SO_2, and CO Concentrations – Alternative 1 Operation without Mitigation

Pollutant	Averaging Time	Background Concentration (µg/m^3)[c]	Maximum Modeled Alternative 1 Concentration Increment (µg/m^3)[d]	Total Ground-Level Concentration (µg/m^3)[e]	SCAQMD Threshold (µg/m^3)	Concentration above threshold?
NO_2	Federal 1-hour[a]	164	28	192	188	Yes
	State 1-hour	190	31	221	338	No
	Federal annual	33	3	36	100	No
	State annual	33	3	36	57	No
SO_2	Federal 1-hour[b]	92	< 0	92	197	No
	State 1-hour	139	< 0	139	655	No
	24-hour	42	< 0	42	105	No
CO	1-hour	3,055	149	3,204	23,000	No
	8-hour	1,757	96	1,853	10,000	No

Notes:
a) The federal 1-hour NO2 modeled concentration represents the 98th percentile of the daily maximum 1-hour averages.
b) The federal 1-hour SO2 modeled concentration represents the 99th percentile of the daily maximum 1-hour averages.
c) The background concentrations for NO_2, SO_2 and CO were obtained from the TITP station.
d) The maximum modeled concentration increment represents Alternative 1 operation minus 2012 terminal operations.
e) Exceedances of the thresholds are indicated in bold.

Table 3-36. Maximum Off-site PM_{10} and $PM_{2.5}$ Concentrations - Alternative 1 Operation without Mitigation

Pollutant	Averaging Time	Maximum Modeled Concentration of Alternative 1 (µg/m^3)	Maximum Modeled Concentration of CEQA Baseline (µg/m^3)	Ground-Level Concentration CEQA Increment (µg/m^3)[a,b]	SCAQMD Threshold (µg/m^3)	CEQA Concentration above threshold?
PM_{10}	24-hour	30.6	22.7	8.1	2.5	Yes
	Annual	13.2	10.0	3.2	1.0	Yes
$PM_{2.5}$	24-hour	8.8	7.8	1.3	2.5	No

Notes:
a) Exceedances of the threshold are indicated in bold. The thresholds for PM_{10} and $PM_{2.5}$ are incremental thresholds; therefore, the incremental concentration without background is compared to the threshold.
b) The CEQA increment represents project minus CEQA baseline.
c) The maximum modeled Alternative 1 concentration, maximum modeled baseline concentrations, and maximum concentration increments may occur at different receptors. Therefore, the modeled Alternative 1 and baseline concentrations in the table may not necessarily subtract to equal the increment.

Figure 3-17. Maximum Air Quality Impact Locations – Alternative 1 Operation without Mitigation

ENVIRON

Port of Los Angeles
YTI Container Terminal
Maximum Air Quality Impact Locations
Alternative 1: Operation without Mitigation

Figure 3-17

3.3.2.3 Alternative 2

Alternative 2 would have the same operational activities as Alternative 1. Therefore, Table 3-35 and Table 3-36, presented under Alternative 1 also represent the maximum off-site ground level concentrations of NO_2, SO_2, CO, PM_{10}, and $PM_{2.5}$ from operation of Alternative 2 without mitigation.

Table 3-35 shows that the maximum off-site NO_2 (federal 1-hour average) concentration from operational activities would exceed the threshold. Table 3-36 shows that the maximum off-site incremental PM_{10} (24-hour and annual average) concentrations from operational activities would exceed the thresholds.

Alternative 2 would have the same operational activities as Alternative 1. Therefore, Figure 3-17, presented under Alternative 1 also represents the maximum air quality impact locations for Alternative 2 operation without mitigation.

Table 3-37 and Table 3-38 summarize the AERMOD modeling results of mitigated Alternative 2 operational emissions. Table 3-37 shows that the maximum off-site NO_2 (federal 1-hour average) concentration from operational activities would be reduced with mitigation but would remain above the threshold. Table 3-38 shows that the maximum off-site incremental PM_{10} (24-hour and annual average) concentrations from operational activities would be reduced with mitigation but would also remain above the thresholds.

There are no major differences in relative emission source group contributions between the proposed Project and any of the project Alternatives. Therefore, the source contributions at the locations of the maximum modeled concentration for Alternative 2 are expected to be similar to those shown for the proposed Project operation in Table 3-31.Figure 3-18 shows the maximum air quality impact locations for Alternative 2 operation. These are the same results as Alternative 1 operation.

Table 3-37. Maximum Off-site NO_2, SO_2 and CO Concentrations Associated with Operation of Alternative 2 without Mitigation

Pollutant	Averaging Time	Background Concentration (µg/m^3)[c]	Maximum Modeled Alternative 2 Concentration Increment (µg/m^3)[d]	Total Ground-Level Concentration (µg/m^3)[e]	SCAQMD Threshold (µg/m^3)	Concentration above threshold?
NO_2	Federal 1-hour[a]	164	28	192	188	Yes
	State 1-hour	190	31	221	338	No
	Federal annual	33	3	36	100	No
	State annual	33	3	36	57	No
SO_2	Federal 1-hour[b]	92	< 0	92	197	No
	State 1-hour	139	< 0	139	655	No
	24-hour	42	< 0	42	105	No
CO	1-hour	3,055	149	3,204	23,000	No
	8-hour	1,757	96	1,853	10,000	No

Notes:
a) The federal 1-hour NO2 modeled concentration represents the 98th percentile of the daily maximum 1-hour averages.
b) The federal 1-hour SO2 modeled concentration represents the 99th percentile of the daily maximum 1-hour averages.
c) The background concentrations for NO_2, SO_2 and CO were obtained from the TITP station.
d) The maximum modeled concentration increment represents Alternative 2 operation minus 2012 terminal operations.
e) Exceedances of the thresholds are indicated in bold.

Table 3-38. Maximum Off-site PM_{10} and $PM_{2.5}$ Concentrations Associated with Operation of Alternative 2 without Mitigation

Pollutant	Averaging Time	Maximum Modeled Concentration of Alternative 2 (µg/m^3)	Maximum Modeled Concentration of CEQA Baseline (µg/m^3)	Maximum Modeled Concentration of NEPA Baseline (µg/m^3)	Ground-Level Concentration CEQA Increment (µg/m^3)[a,b]	Ground-Level Concentration NEPA Increment (µg/m^3)[a,c]	SCAQMD Threshold (µg/m^3)	CEQA Concentration above threshold?
PM_{10}	24-hour	30.6	22.7	30.6	8.1	0	2.5	Yes
	Annual	13.2	10.0	13.2	3.2	0	1.0	Yes
$PM_{2.5}$	24-hour	8.8	7.8	8.8	1.3	0	2.5	No

Notes:
a) Exceedances of the threshold are indicated in bold. The thresholds for PM_{10} and $PM_{2.5}$ are incremental thresholds; therefore, the incremental concentration without background is compared to the threshold.
b) The CEQA increment represents project minus CEQA baseline.
c) The NEPA increment represents project minus NEPA Baseline.
d) The maximum modeled Alternative 2 concentration, maximum modeled baseline concentrations, and maximum concentration increments may occur at different receptors. Therefore, the modeled Alternative 2 and baseline concentrations in the table may not necessarily subtract to equal the increment.

Figure 3-18. Maximum Air Quality Impact Locations – Alternative 2 Operation without Mitigation

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Port of Los Angeles
YTI Container Terminal
Maximum Air Quality Impact Locations
Alternative 2: Operation without Mitigation

Figure 3-18

3.3.2.4 Alternative 3

Table 3-39 and Table 3-40 summarize the AERMOD modeling results of unmitigated Alternative 3 operational emissions. NO_2, SO_2, and CO concentrations due to operation were added to background concentrations and compared to the SCAQMD thresholds. The AERMOD modeling results for PM_{10} and $PM_{2.5}$ represent the incremental increases due to the alternative and were compared directly to the SCAQMD thresholds without adding a background concentration.

Table 3-39 shows that the maximum off-site NO_2 (federal 1-hour average) concentration from operational activities would exceed the threshold. Table 3-40 shows that the maximum off-site incremental PM_{10} (24-hour and annual average) concentrations from operational activities would exceed the thresholds.

There are no major differences in relative emission source group contributions between the proposed Project and all project Alternatives. Therefore, source contributions at the locations of the maximum modeled concentration for Alternative 3 are expected to be similar to those shown for the proposed Project operation in Table 3-31.Figure 3-19 shows the maximum air quality impact locations for Alternative 3 operation. Maximum air quality impact locations are similar to those for Alternative 1, which are discussed above.

Table 3-39. Maximum Off-site NO_2, SO_2, and CO Concentrations – Alternative 3 Operation without Mitigation

Pollutant	Averaging Time	Background Concentration (µg/m^3)[c]	Maximum Modeled Alternative 3 Concentration Increment (µg/m^3)[d]	Total Ground-Level Concentration (µg/m^3)[e]	SCAQMD Threshold (µg/m^3)	Concentration above threshold?
NO_2	Federal 1-hour[a]	164	65	229	188	Yes
	State 1-hour	190	72	262	338	No
	Federal annual	33	5	38	100	No
	State annual	33	5	38	57	No
SO_2	Federal 1-hour[b]	92	< 0	92	197	No
	State 1-hour	139	< 0	139	655	No
	24-hour	42	< 0	42	105	No
CO	1-hour	3,055	215	3,269	23,000	No
	8-hour	1,757	141	1,897	10,000	No

Notes:
a) The federal 1-hour NO2 modeled concentration represents the 98th percentile of the daily maximum 1-hour averages.
b) The federal 1-hour SO2 modeled concentration represents the 99th percentile of the daily maximum 1-hour averages.
c) The background concentrations for NO_2, SO_2 and CO were obtained from the TITP station.
d) The maximum modeled concentration increment represents Alternative 3 operation minus 2012 terminal operations.
e) Exceedances of the thresholds are indicated in bold.

Table 3-40. Maximum Off-site PM_{10} and $PM_{2.5}$ Concentrations – Alternative 3 Operation without Mitigation

Pollutant	Averaging Time	Maximum Modeled Concentration of Alternative 3 (µg/m^3)	Maximum Modeled Concentration of CEQA Baseline (µg/m^3)	Maximum Modeled Concentration of NEPA Baseline (µg/m^3)	Ground-Level Concentration CEQA Increment (µg/m^3)[a,b]	Ground-Level Concentration NEPA Increment (µg/m^3)[a,c]	SCAQMD Threshold (µg/m^3)	CEQA Concentration above threshold?	NEPA Concentration above threshold?
PM_{10}	24-hour	33.9	22.7	30.6	11.5	3.5	2.5	Yes	Yes
	Annual	14.6	10.0	13.2	4.5	1.3	1.0	Yes	Yes
$PM_{2.5}$	24-hour	9.7	7.8	8.8	2.1	1.0	2.5	No	No

Notes:
a) Exceedances of the threshold are indicated in bold. The thresholds for PM_{10} and $PM_{2.5}$ are incremental thresholds; therefore, the incremental concentration without background is compared to the threshold.
b) The CEQA increment represents project minus CEQA baseline.
c) The NEPA increment represents project minus NEPA Baseline.
d) The maximum modeled Alternative 3 concentration, maximum modeled baseline concentrations, and maximum concentration increments may occur at different receptors. Therefore, the modeled Alternative 3 and baseline concentrations in the table may not necessarily subtract to equal the increment.

Figure 3-19. Maximum Air Quality Impact Locations – Alternative 3 Operation without Mitigation

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Port of Los Angeles
YTI Container Terminal
Maximum Air Quality Impact Locations
Alternative 3: Operation without Mitigation

Figure 3-19

Table 3-41 and Table 3-42 summarize the AERMOD modeling results of mitigated Alternative 3 operational emissions.

Table 3-41 shows that the maximum off-site NO_2 (federal 1-hour average) concentration from operational activities would not be substantially reduced with mitigation, and would remain above the threshold. Table 3-42 shows that the maximum off-site incremental PM_{10} (24-hour and annual average) concentrations from operational activities would not be substantially reduced with mitigation, and would remain above the thresholds.

There are no major differences in relative emission source group contributions between the proposed Project and any of the project Alternatives, Therefore, the source contributions at the locations of the maximum modeled concentration for Alternative 3 are expected to be similar to those shown for the proposed Project operation in Table 3-31.

Figure 3-20 shows the maximum air quality impact locations for Alternative 3 operation with mitigation. Maximum air quality impact locations are similar to those for Alternative 1, which have previously been discussed.

Table 3-41. Maximum Off-site NO_2, SO_2 and CO Concentrations – Alternative 3 Operation with Mitigation

Pollutant	Averaging Time	Background Concentration (µg/m^3)[c]	Maximum Modeled Alternative 3 Concentration Increment (µg/m^3)[d]	Total Ground-Level Concentration (µg/m^3)[e]	SCAQMD Threshold (µg/m^3)	Concentration above threshold?
NO_2	Federal 1-hour[a]	164	65	229	188	Yes
	State 1-hour	190	72	262	338	No
	Federal annual	33	5	38	100	No
	State annual	33	5	38	57	No
SO_2	Federal 1-hour[b]	92	< 0	92	197	No
	State 1-hour	139	< 0	139	655	No
	24-hour	42	< 0	42	105	No
CO	1-hour	3,055	215	3,269	23,000	No
	8-hour	1,757	141	1,897	10,000	No

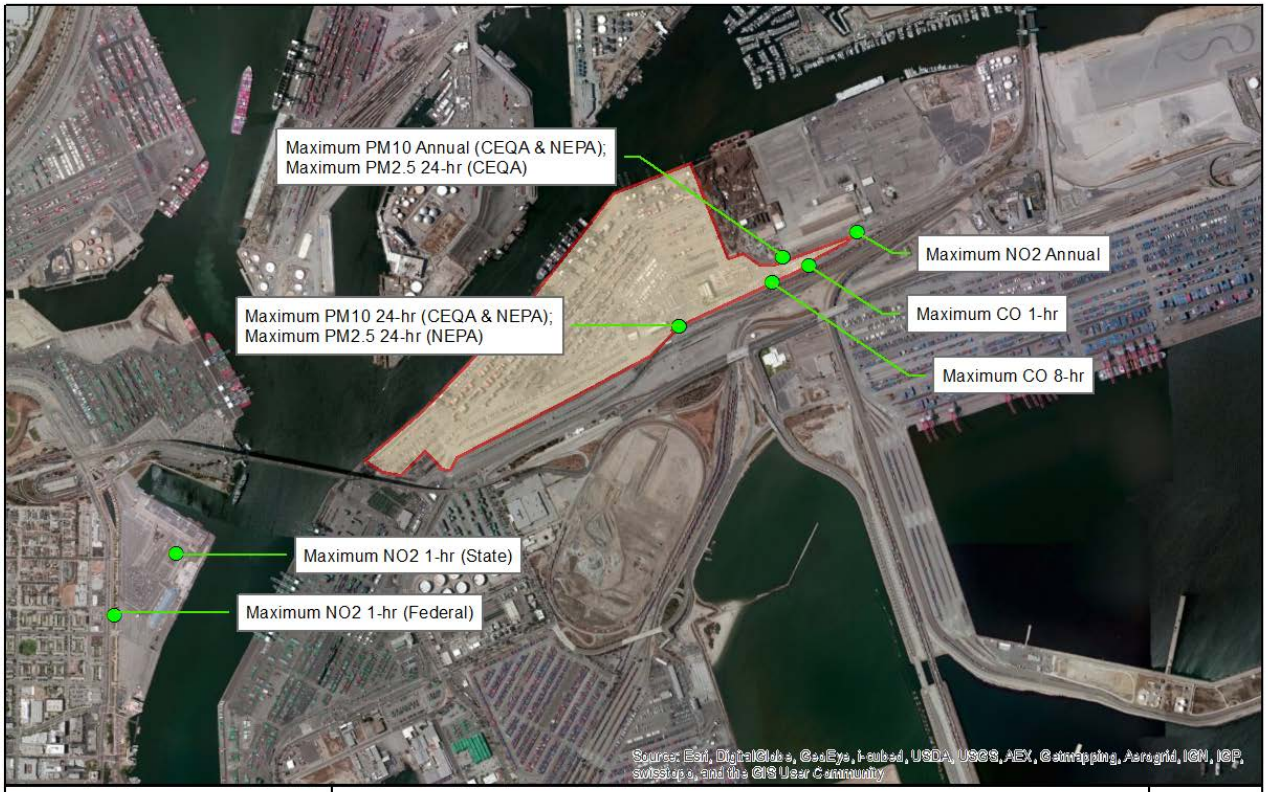
Notes:
a) The federal 1-hour NO2 modeled concentration represents the 98th percentile of the daily maximum 1-hour averages.
b) The federal 1-hour SO2 modeled concentration represents the 99th percentile of the daily maximum 1-hour averages.
c) The background concentrations for NO_2, SO_2 and CO were obtained from the TITP station.
d) The maximum modeled concentration increment represents Alternative 3 operation minus 2012 terminal operations.
e) Exceedances of the thresholds are indicated in bold.

Table 3-42. Maximum Off-site PM_{10} and $PM_{2.5}$ Concentrations – Alternative 3 Operation with Mitigation

Pollutant	Averaging Time	Maximum Modeled Concentration of Alternative 3 (µg/m^3)	Maximum Modeled Concentration of CEQA Baseline (µg/m^3)	Maximum Modeled Concentration of NEPA Baseline (µg/m^3)	Ground-Level Concentration CEQA Increment (µg/m^3)[a,b]	Ground-Level Concentration NEPA Increment (µg/m^3)[a,c]	SCAQMD Threshold (µg/m^3)	CEQA Concentration above threshold?	NEPA Concentration above threshold?
PM_{10}	24-hour	33.9	22.7	30.6	11.5	3.5	2.5	Yes	Yes
	Annual	14.6	10.0	13.2	4.5	1.3	1.0	Yes	Yes
$PM_{2.5}$	24-hour	9.7	7.8	8.8	2.1	1.0	2.5	No	No

Notes:
a) Exceedances of the threshold are indicated in bold. The thresholds for PM_{10} and $PM_{2.5}$ are incremental thresholds; therefore, the incremental concentration without background is compared to the threshold.
b) The CEQA increment represents project minus CEQA baseline.
c) The NEPA increment represents project minus NEPA Baseline.
d) The maximum modeled Alternative 3 concentration, maximum modeled baseline concentrations, and maximum concentration increments may occur at different receptors. Therefore, the modeled Alternative 3 and baseline concentrations in the table may not necessarily subtract to equal the increment.

Figure 3-20. Maximum Air Quality Impact Locations – Alternative 3 Operation with Mitigation



ENVIRON

Port of Los Angeles
YTI Container Terminal
Maximum Air Quality Impact Locations
Alternative 3: Operation with Mitigation

Figure 3-20

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Attachment B2.1

CO Hot Spots CAL3QHC Model Output

CAL3QHC Model Output

Henry Ford Ave. and Anaheim St.
Baseline 2012

JOB: YTI BL 2012 - Henry Ford/Anaheim RUN: Peak Hour CO - Year 2012

DATE : 2/14/14

TIME : 16:38: 3

The MODE flag has been set to C for calculating CO averages.

SITE & METEOROLOGICAL VARIABLES

VS = 0.0 CM/S VD = 0.0 CM/S Z0 = 100. CM

U = 1.0 M/S CLAS = 6 (F) ATIM = 60. MINUTES MIXH = 1000. M AMB = 0.0 PPM

LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (FT)				*	LENGTH	BRG	TYPE	VPH	EF	H	W	V/C	QUEUE
	*	X1	Y1	X2	Y2	*	(FT)	(DEG)			(G/MI)	(FT)	(FT)		(VEH)
1. NBTR	*	33.0	-500.0	25.0	0.0	*	500.	359.	AG	277.	5.4	0.0	56.0		
2. NBL	*	20.0	-500.0	4.0	0.0	*	500.	358.	AG	240.	5.4	0.0	44.0		

3.	SBL	*	-6.0	500.0	7.0	-12.0	*	512.	179.	AG	149.	5.4	0.0	32.0
4.	SBTR	*	-15.0	-12.0	-17.0	500.0	*	512.	360.	AG	242.	5.4	0.0	56.0
5.	WBL	*	0.0	-7.0	500.0	6.0	*	500.	89.	AG	47.	5.4	0.0	32.0
6.	WBTR	*	0.0	12.0	500.0	12.0	*	500.	90.	AG	988.	3.6	0.0	56.0
7.	EBT	*	-500.0	-31.0	12.0	-26.0	*	512.	89.	AG	1100.	4.0	0.0	44.0
8.	EBL	*	-500.0	-24.0	12.0	-5.0	*	512.	88.	AG	102.	5.4	0.0	32.0
9.	NBD	*	25.0	0.0	25.0	500.0	*	500.	360.	AG	427.	2.9	0.0	44.0
10.	SBD	*	-12.0	-500.0	-15.0	-12.0	*	488.	360.	AG	263.	5.4	0.0	56.0
11.	WBD	*	-500.0	12.0	0.0	12.0	*	500.	90.	AG	1109.	2.5	0.0	44.0
12.	EBD	*	12.0	-26.0	500.0	-22.0	*	488.	90.	AG	1346.	2.5	0.0	44.0
13.	NBAX	*	33.0	-2000.0	33.0	-500.0	*	1500.	360.	AG	517.	2.2	0.0	56.0
14.	NBDX	*	25.0	500.0	25.0	2000.0	*	1500.	360.	AG	427.	2.2	0.0	44.0
15.	SBAX	*	-17.0	500.0	-17.0	2000.0	*	1500.	360.	AG	391.	2.2	0.0	56.0
16.	SBDX	*	-20.0	-2000.0	-18.0	-500.0	*	1500.	0.	AG	466.	2.2	0.0	56.0
17.	WBDX	*	-2000.0	12.0	-500.0	12.0	*	1500.	90.	AG	1109.	2.2	0.0	44.0
18.	EBAX	*	-2000.0	-31.0	-500.0	-31.0	*	1500.	90.	AG	1405.	2.2	0.0	44.0
19.	EBDX	*	500.0	-22.0	2000.0	-22.0	*	1500.	90.	AG	1346.	2.2	0.0	44.0
20.	EBRX1	*	-500.0	-38.0	-132.0	-42.0	*	368.	91.	AG	203.	2.4	0.0	32.0
21.	EBRX2	*	-132.0	-42.0	-55.0	-64.0	*	80.	106.	AG	203.	2.4	0.0	32.0
22.	EBRX3	*	-55.0	-64.0	-39.0	-137.0	*	75.	168.	AG	203.	2.4	0.0	32.0
23.	EBRX4	*	-39.0	-137.0	-32.0	-500.0	*	363.	179.	AG	203.	2.4	0.0	32.0
24.	WBAX	*	500.0	12.0	2000.0	12.0	*	1500.	90.	AG	1035.	2.2	0.0	44.0

JOB: YTI BL 2012 - Henry Ford/Anaheim RUN: Peak Hour CO - Year 2012

DATE : 2/14/14

TIME : 16:38: 3

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE

RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (FT) X	Y	Z
1. R01	-197.0	-58.0	5.9
2. R02	-146.0	-58.0	5.9
3. R03	-101.0	-67.0	5.9
4. R04	-64.0	-106.0	5.9
5. R05	-56.0	-142.0	5.9

6.	R06	*	-55.0	-191.0	5.9	*
7.	R07	*	62.0	-216.0	5.9	*
8.	R08	*	60.0	-134.0	5.9	*
9.	R09	*	60.0	-62.0	5.9	*
10.	R10	*	132.0	-62.0	5.9	*
11.	R11	*	214.0	-62.0	5.9	*
12.	R12	*	58.0	200.0	5.9	*
13.	R13	*	58.0	118.0	5.9	*
14.	R14	*	58.0	46.0	5.9	*
15.	R15	*	130.0	46.0	5.9	*
16.	R16	*	212.0	46.0	5.9	*
17.	R17	*	-199.0	44.0	5.9	*
18.	R18	*	-117.0	44.0	5.9	*
19.	R19	*	-45.0	44.0	5.9	*
20.	R20	*	-45.0	116.0	5.9	*
21.	R21	*	-45.0	198.0	5.9	*

JOB: YTI BL 2012 - Henry Ford/Anaheim RUN: Peak Hour CO - Year 2012

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-360.

WIND ANGLE (DEGR)	* CONCENTRATION (PPM) *	REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15	REC16	REC17	REC18	REC19	REC20
0.	*	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
10.	*	0.2	0.2	0.2	0.2	0.2	0.2	0.0	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
20.	*	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1

```
  30.  *   0.2   0.2   0.2   0.1   0.2   0.2   0.2   0.2   0.2   0.2   0.2   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.1
0.1

  40.  *   0.3   0.3   0.2   0.2   0.3   0.3   0.1   0.2   0.2   0.2   0.2   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.1
0.1

  50.  *   0.3   0.3   0.2   0.2   0.2   0.2   0.2   0.2   0.2   0.2   0.2   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
0.0

  60.  *   0.3   0.3   0.3   0.2   0.2   0.2   0.1   0.2   0.2   0.2   0.2   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
0.0

  70.  *   0.5   0.3   0.3   0.2   0.2   0.1   0.1   0.2   0.3   0.3   0.3   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
0.0

  80.  *   0.4   0.4   0.3   0.4   0.2   0.2   0.1   0.2   0.4   0.5   0.4   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
0.0

  90.  *   0.3   0.3   0.2   0.1   0.0   0.0   0.0   0.0   0.3   0.3   0.2   0.0   0.0   0.3   0.3   0.3   0.3   0.3   0.4
0.0

 100.  *   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.2   0.2   0.5   0.5   0.4   0.3   0.4   0.4
0.3

 110.  *   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.1   0.2   0.3   0.3   0.3   0.3   0.3   0.3
0.2

 120.  *   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.1   0.2   0.3   0.3   0.3   0.2   0.2   0.3
0.2

 130.  *   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.2   0.2   0.2   0.2   0.2   0.2   0.2   0.3
0.2

 140.  *   0.0   0.0   0.0   0.0   0.1   0.1   0.0   0.0   0.0   0.0   0.0   0.1   0.2   0.2   0.2   0.2   0.2   0.2   0.2
0.3

 150.  *   0.0   0.0   0.0   0.1   0.1   0.1   0.0   0.0   0.0   0.0   0.0   0.1   0.2   0.2   0.2   0.2   0.2   0.2   0.2
0.2

 160.  *   0.0   0.0   0.0   0.1   0.1   0.1   0.0   0.0   0.0   0.0   0.0   0.0   0.2   0.2   0.2   0.2   0.2   0.2   0.5
0.2

 170.  *   0.0   0.0   0.0   0.1   0.2   0.1   0.0   0.0   0.0   0.0   0.0   0.1   0.2   0.2   0.2   0.2   0.2   0.2   0.5
0.5
```

```
 180.  *   0.0   0.0   0.0   0.0   0.0   0.0   0.1   0.1   0.1   0.0   0.0   0.1   0.3   0.3   0.2   0.2   0.2   0.2   0.3
0.2

 190.  *   0.0   0.0   0.0   0.0   0.0   0.0   0.1   0.2   0.2   0.0   0.0   0.1   0.4   0.4   0.2   0.2   0.2   0.2   0.2
0.1

 200.  *   0.0   0.0   0.0   0.0   0.0   0.0   0.2   0.3   0.3   0.0   0.0   0.2   0.2   0.5   0.2   0.2   0.2   0.2   0.2
0.2

 210.  *   0.0   0.0   0.0   0.0   0.0   0.0   0.1   0.1   0.1   0.0   0.0   0.2   0.2   0.2   0.2   0.2   0.2   0.2   0.2
0.1

 220.  *   0.0   0.0   0.0   0.0   0.0   0.0   0.1   0.1   0.1   0.0   0.0   0.1   0.2   0.2   0.2   0.2   0.2   0.2   0.2
0.2

 230.  *   0.0   0.0   0.0   0.0   0.0   0.0   0.1   0.1   0.1   0.0   0.0   0.1   0.2   0.2   0.2   0.2   0.2   0.2   0.2
0.2

 240.  *   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.2   0.2   0.3   0.4   0.3   0.2   0.2   0.2
0.2

 250.  *   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.2   0.4   0.4   0.4   0.3   0.4   0.4
0.2

 260.  *   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.2   0.2   0.5   0.4   0.5   0.5   0.4   0.4
0.2

 270.  *   0.3   0.3   0.3   0.1   0.0   0.0   0.0   0.1   0.4   0.3   0.3   0.0   0.0   0.3   0.3   0.4   0.3   0.3   0.3
0.0

 280.  *   0.5   0.7   0.5   0.3   0.2   0.2   0.2   0.3   0.4   0.4   0.3   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
0.0

 290.  *   0.4   0.4   0.3   0.2   0.1   0.1   0.1   0.2   0.3   0.3   0.3   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
0.0

 300.  *   0.3   0.3   0.3   0.2   0.2   0.1   0.1   0.2   0.3   0.2   0.2   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
0.0

 310.  *   0.3   0.3   0.3   0.2   0.2   0.1   0.2   0.3   0.3   0.2   0.2   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
0.0

 320.  *   0.3   0.3   0.2   0.2   0.1   0.1   0.2   0.2   0.1   0.2   0.2   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
0.0
```

```
 330.  *   0.2   0.2   0.2   0.1   0.1   0.1   0.2   0.2   0.2   0.2   0.2   0.1   0.1   0.1   0.0   0.0   0.0   0.0   0.0
0.0

 340.  *   0.2   0.2   0.2   0.1   0.1   0.1   0.1   0.1   0.3   0.2   0.2   0.1   0.1   0.2   0.0   0.0   0.0   0.0   0.0
0.0

 350.  *   0.2   0.2   0.2   0.1   0.1   0.1   0.1   0.4   0.3   0.2   0.2   0.1   0.1   0.1   0.0   0.0   0.0   0.0   0.0
0.0

 360.  *   0.2   0.2   0.2   0.1   0.1   0.1   0.0   0.2   0.2   0.2   0.2   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.1
0.1

 ------*-------------------------------------------------------------------------------------------------------------------
-

 MAX   *   0.5   0.7   0.5   0.4   0.3   0.3   0.2   0.4   0.4   0.5   0.4   0.2   0.4   0.5   0.5   0.5   0.5   0.4   0.5
0.5

 DEGR. *   70   280   280    80    40    40    30   350    80    80    80   100   190   100   100   260   260   100   160   170
```

JOB: YTI BL 2012 - Henry Ford/Anaheim RUN: Peak Hour CO - Year 2012

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-360.

WIND ANGLE (DEGR)	CONCENTRATION (PPM) REC21
0.	0.1
10.	0.1
20.	0.1
30.	0.1
40.	0.1
50.	0.0

```
 60.  *   0.0
 70.  *   0.0
 80.  *   0.0
 90.  *   0.0
100.  *   0.2
110.  *   0.1
120.  *   0.2
130.  *   0.2
140.  *   0.2
150.  *   0.2
160.  *   0.1
170.  *   0.3
180.  *   0.1
190.  *   0.1
200.  *   0.1
210.  *   0.1
220.  *   0.1
230.  *   0.1
240.  *   0.1
250.  *   0.1
260.  *   0.2
270.  *   0.0
280.  *   0.0
```

```
290.  *   0.0

300.  *   0.0

310.  *   0.0

320.  *   0.0

330.  *   0.0

340.  *   0.0

350.  *   0.0

360.  *   0.1

------*------

MAX   *   0.3

DEGR. *  170


THE HIGHEST CONCENTRATION OF    0.70 PPM OCCURRED AT RECEPTOR REC2 .
```

JOB: YTI BL 2012 - Henry Ford/Anaheim RUN: Peak Hour CO - Year 2012

DATE : 2/14/14

TIME : 16:38: 3

RECEPTOR - LINK MATRIX FOR THE ANGLE PRODUCING

THE MAXIMUM CONCENTRATION FOR EACH RECEPTOR

		REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15	REC16	REC17	REC18	REC19	REC20
	* CO/LINK (PPM)																				
	* ANGLE (DEGREES)																				
LINK #	*	70	280	280	80	40	40	30	350	80	80	80	100	190	100	100	260	260	100	160	170
1	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1
2	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1
3	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1

5	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	*	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.3	0.3	0.2	0.0	0.2	0.0	0.0
7	*	0.3	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.1	0.1
8	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	*	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1
11	*	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.0
12	*	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.0
13	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17	*	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
18	*	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
19	*	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0

```
      20  *   0.0   0.1   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
0.0

      21  *   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
0.0

      22  *   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
0.0

      23  *   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
0.0

      24  *   0.0   0.0   0.0   0.1   0.0   0.0   0.0   0.0   0.1   0.1   0.1   0.1   0.0   0.0   0.0   0.0   0.0   0.0   0.0
0.0
```

```
   JOB: YTI BL 2012 - Henry Ford/Anaheim                    RUN: Peak Hour CO - Year 2012


   DATE :  2/14/14

   TIME : 16:38: 3



   RECEPTOR - LINK MATRIX FOR THE ANGLE PRODUCING

   THE MAXIMUM CONCENTRATION FOR EACH RECEPTOR


       *    CO/LINK  (PPM)

       *    ANGLE (DEGREES)

       *  REC21

LINK # *   170

-------*------

    1  *   0.1

    2  *   0.1

    3  *   0.0

    4  *   0.1

    5  *   0.0

    6  *   0.0

    7  *   0.0

    8  *   0.0
```

```
 9  *   0.0
10  *   0.0
11  *   0.0
12  *   0.0
13  *   0.0
14  *   0.0
15  *   0.0
16  *   0.0
17  *   0.0
18  *   0.0
19  *   0.0
20  *   0.0
21  *   0.0
22  *   0.0
23  *   0.0
24  *   0.0
```

CAL3QHC Model Output

Henry Ford Ave. and Anaheim St.
Proposed Project without Mitigation - 2017

JOB: YTI PP 2017 - Henry Ford/Anaheim RUN: Peak Hour CO - Year 2017

DATE : 2/14/14

TIME : 16:38: 3

The MODE flag has been set to C for calculating CO averages.

SITE & METEOROLOGICAL VARIABLES

VS = 0.0 CM/S VD = 0.0 CM/S Z0 = 100. CM

U = 1.0 M/S CLAS = 6 (F) ATIM = 60. MINUTES MIXH = 1000. M AMB = 0.0 PPM

LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (FT)				*	LENGTH	BRG	TYPE	VPH	EF	H	W	V/C	QUEUE
	*	X1	Y1	X2	Y2	*	(FT)	(DEG)			(G/MI)	(FT)	(FT)		(VEH)
1. NBTR	*	33.0	-500.0	25.0	0.0	*	500.	359.	AG	1402.	4.7	0.0	56.0		
2. NBL	*	20.0	-500.0	4.0	0.0	*	500.	358.	AG	195.	4.2	0.0	44.0		

3.	SBL	*	-6.0	500.0	7.0	-12.0	*	512.	179.	AG	152.	4.2	0.0	32.0
4.	SBTR	*	-15.0	-12.0	-17.0	500.0	*	512.	360.	AG	1129.	4.7	0.0	56.0
5.	WBL	*	0.0	-7.0	500.0	6.0	*	500.	89.	AG	237.	4.7	0.0	32.0
6.	WBTR	*	0.0	12.0	500.0	12.0	*	500.	90.	AG	1225.	4.7	0.0	56.0
7.	EBT	*	-500.0	-31.0	12.0	-26.0	*	512.	89.	AG	883.	4.7	0.0	44.0
8.	EBL	*	-500.0	-24.0	12.0	-5.0	*	512.	88.	AG	75.	4.7	0.0	32.0
9.	NBD	*	25.0	0.0	25.0	500.0	*	500.	360.	AG	1340.	4.7	0.0	44.0
10.	SBD	*	-12.0	-500.0	-15.0	-12.0	*	488.	360.	AG	1346.	2.3	0.0	56.0
11.	WBD	*	-500.0	12.0	0.0	12.0	*	500.	90.	AG	1311.	4.7	0.0	44.0
12.	EBD	*	12.0	-26.0	500.0	-22.0	*	488.	90.	AG	1301.	4.7	0.0	44.0
13.	NBAX	*	33.0	-2000.0	33.0	-500.0	*	1500.	360.	AG	1597.	1.6	0.0	56.0
14.	NBDX	*	25.0	500.0	25.0	2000.0	*	1500.	360.	AG	1340.	1.6	0.0	44.0
15.	SBAX	*	-17.0	500.0	-17.0	2000.0	*	1500.	360.	AG	1281.	1.6	0.0	56.0
16.	SBDX	*	-20.0	-2000.0	-18.0	-500.0	*	1500.	0.	AG	2235.	1.6	0.0	56.0
17.	WBDX	*	-2000.0	12.0	-500.0	12.0	*	1500.	90.	AG	1311.	1.6	0.0	44.0
18.	EBAX	*	-2000.0	-31.0	-500.0	-31.0	*	1500.	90.	AG	1847.	1.6	0.0	44.0
19.	EBDX	*	500.0	-22.0	2000.0	-22.0	*	1500.	90.	AG	1301.	1.6	0.0	44.0
20.	EBRX1	*	-500.0	-38.0	-132.0	-42.0	*	368.	91.	AG	889.	1.8	0.0	32.0
21.	EBRX2	*	-132.0	-42.0	-55.0	-64.0	*	80.	106.	AG	889.	1.8	0.0	32.0
22.	EBRX3	*	-55.0	-64.0	-39.0	-137.0	*	75.	168.	AG	889.	1.8	0.0	32.0
23.	EBRX4	*	-39.0	-137.0	-32.0	-500.0	*	363.	179.	AG	889.	1.8	0.0	32.0
24.	WBAX	*	500.0	12.0	2000.0	12.0	*	1500.	90.	AG	1462.	1.6	0.0	44.0

JOB: YTI PP 2017 - Henry Ford/Anaheim RUN: Peak Hour CO - Year 2017

DATE : 2/14/14

TIME : 16:38: 3

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE

RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (FT) X	Y	Z
1. R01	-197.0	-58.0	5.9
2. R02	-146.0	-58.0	5.9
3. R03	-101.0	-67.0	5.9
4. R04	-64.0	-106.0	5.9
5. R05	-56.0	-142.0	5.9

6. R06	*	-55.0	-191.0	5.9	*
7. R07	*	62.0	-216.0	5.9	*
8. R08	*	60.0	-134.0	5.9	*
9. R09	*	60.0	-62.0	5.9	*
10. R10	*	132.0	-62.0	5.9	*
11. R11	*	214.0	-62.0	5.9	*
12. R12	*	58.0	200.0	5.9	*
13. R13	*	58.0	118.0	5.9	*
14. R14	*	58.0	46.0	5.9	*
15. R15	*	130.0	46.0	5.9	*
16. R16	*	212.0	46.0	5.9	*
17. R17	*	-199.0	44.0	5.9	*
18. R18	*	-117.0	44.0	5.9	*
19. R19	*	-45.0	44.0	5.9	*
20. R20	*	-45.0	116.0	5.9	*
21. R21	*	-45.0	198.0	5.9	*

JOB: YTI PP 2017 - Henry Ford/Anaheim RUN: Peak Hour CO - Year 2017

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-360.

WIND ANGLE (DEGR)	* CONCENTRATION (PPM) REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15	REC16	REC17	REC18	REC19	REC20
0.	0.3	0.3	0.3	0.4	0.6	0.5	0.6	0.6	0.6	0.3	0.3	0.3	0.4	0.4	0.0	0.0	0.0	0.0	0.5	0.5
10.	0.4	0.6	0.6	0.8	0.9	0.8	0.2	0.2	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.7	0.6
20.	0.5	0.5	0.7	0.7	0.6	0.6	0.2	0.2	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.5	0.5

30.	*	0.5	0.4	0.6	0.7	0.6	0.6	0.2	0.2	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.5	0.5
40.	*	0.5	0.4	0.5	0.7	0.6	0.6	0.2	0.2	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.4	0.4
50.	*	0.7	0.6	0.6	0.5	0.4	0.5	0.2	0.2	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.3	0.3
60.	*	0.7	0.7	0.5	0.6	0.6	0.6	0.2	0.3	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.3	0.3
70.	*	0.7	0.7	0.8	0.7	0.5	0.5	0.0	0.3	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.3	0.3
80.	*	0.8	1.0	0.8	0.7	0.5	0.5	0.2	0.3	0.7	0.5	0.6	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.3	0.3
90.	*	0.7	0.8	0.7	0.3	0.3	0.3	0.0	0.0	0.3	0.3	0.3	0.0	0.0	0.4	0.4	0.3	0.7	0.7	0.8	0.3
100.	*	0.1	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.7	0.6	0.7	0.8	1.0	1.0	0.6
110.	*	0.1	0.2	0.2	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.5	0.5	0.5	0.6	0.8	0.9	0.6
120.	*	0.1	0.2	0.2	0.3	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.5	0.5	0.5	0.5	0.7	0.8	0.6
130.	*	0.1	0.2	0.2	0.3	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.4	0.4	0.4	0.4	0.5	0.7	0.5
140.	*	0.2	0.2	0.2	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.3	0.3	0.3	0.5	0.5	0.8	0.5
150.	*	0.2	0.2	0.3	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.3	0.3	0.3	0.5	0.6	0.8	0.6
160.	*	0.2	0.2	0.3	0.4	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.3	0.3	0.3	0.3	0.5	0.8	0.6
170.	*	0.2	0.2	0.3	0.5	0.7	0.6	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.3	0.3	0.3	0.5	0.6	0.9	0.8

180.	*	0.0	0.0	0.1	0.2	0.4	0.4	0.4	0.5	0.5	0.0	0.0	0.7	0.7	0.8	0.3	0.3	0.3	0.4	0.8	0.7
190.	*	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.7	0.7	0.3	0.2	0.7	0.8	0.9	0.6	0.5	0.3	0.3	0.3	0.2
200.	*	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.5	0.3	0.2	0.6	0.6	0.8	0.6	0.5	0.3	0.3	0.3	0.2
210.	*	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.4	0.3	0.1	0.7	0.7	0.7	0.6	0.5	0.3	0.3	0.3	0.2
220.	*	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.4	0.3	0.1	0.5	0.5	0.7	0.6	0.4	0.3	0.3	0.3	0.2
230.	*	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.2	0.1	0.5	0.5	0.6	0.5	0.5	0.3	0.3	0.3	0.2
240.	*	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.1	0.1	0.5	0.6	0.6	0.6	0.6	0.4	0.4	0.4	0.3
250.	*	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.1	0.1	0.4	0.6	0.9	0.7	0.6	0.5	0.5	0.6	0.3
260.	*	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.1	0.1	0.5	0.6	1.0	0.9	0.9	0.7	0.6	0.6	0.3
270.	*	0.4	0.4	0.4	0.1	0.0	0.0	0.3	0.4	0.5	0.3	0.5	0.3	0.3	0.7	0.7	0.7	0.3	0.4	0.4	0.0
280.	*	0.8	0.8	0.6	0.3	0.2	0.2	0.4	0.6	0.8	0.6	0.6	0.3	0.3	0.3	0.2	0.2	0.0	0.0	0.0	0.0
290.	*	0.5	0.5	0.5	0.3	0.2	0.1	0.4	0.5	0.8	0.6	0.6	0.3	0.3	0.3	0.2	0.2	0.0	0.0	0.0	0.0
300.	*	0.5	0.5	0.6	0.2	0.2	0.2	0.5	0.5	0.7	0.7	0.7	0.3	0.3	0.3	0.2	0.2	0.0	0.0	0.0	0.0
310.	*	0.5	0.5	0.4	0.2	0.2	0.2	0.5	0.5	0.7	0.5	0.6	0.3	0.3	0.3	0.2	0.2	0.0	0.0	0.0	0.0
320.	*	0.3	0.3	0.3	0.2	0.2	0.2	0.6	0.6	0.7	0.5	0.5	0.3	0.3	0.3	0.2	0.2	0.0	0.0	0.0	0.0

```
 330.  *   0.3   0.3   0.3   0.2   0.2   0.2   0.6   0.6   0.8   0.6   0.5   0.5   0.5   0.5   0.3   0.2   0.0   0.0   0.0
0.0

 340.  *   0.3   0.3   0.3   0.2   0.2   0.2   0.7   0.8   1.0   0.6   0.4   0.6   0.6   0.6   0.3   0.0   0.0   0.0   0.0
0.0

 350.  *   0.3   0.3   0.3   0.2   0.2   0.2   0.9   0.9   1.0   0.6   0.4   0.7   0.6   0.6   0.3   0.1   0.0   0.0   0.0
0.0

 360.  *   0.3   0.3   0.3   0.4   0.6   0.5   0.6   0.6   0.6   0.3   0.3   0.3   0.4   0.4   0.0   0.0   0.0   0.0   0.5
0.5

 ------*-------------------------------------------------------------------------------------------------------------------
-

 MAX   *   0.8   1.0   0.8   0.8   0.9   0.8   0.9   0.9   1.0   0.7   0.7   0.7   0.8   1.0   0.9   0.9   0.8   1.0   1.0
0.8

 DEGR. *   80    80    80    10    10    10    350   350   340   300   300   180   190   260   260   260   100   100   100   170
```

JOB: YTI PP 2017 - Henry Ford/Anaheim RUN: Peak Hour CO - Year 2017

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-360.

WIND ANGLE (DEGR)	CONCENTRATION (PPM) REC21
0.	0.4
10.	0.6
20.	0.5
30.	0.5
40.	0.4
50.	0.3

```
 60.  *   0.3
 70.  *   0.3
 80.  *   0.3
 90.  *   0.3
100.  *   0.4
110.  *   0.4
120.  *   0.5
130.  *   0.5
140.  *   0.6
150.  *   0.7
160.  *   0.7
170.  *   0.7
180.  *   0.8
190.  *   0.2
200.  *   0.2
210.  *   0.2
220.  *   0.2
230.  *   0.2
240.  *   0.2
250.  *   0.1
260.  *   0.2
270.  *   0.0
280.  *   0.0
```

```
290.  *   0.0

300.  *   0.0

310.  *   0.0

320.  *   0.0

330.  *   0.0

340.  *   0.0

350.  *   0.0

360.  *   0.4

------*------

MAX   *   0.8

DEGR. *  180


THE HIGHEST CONCENTRATION OF    1.00 PPM OCCURRED AT RECEPTOR REC19.
```

JOB: YTI PP 2017 - Henry Ford/Anaheim RUN: Peak Hour CO - Year 2017

DATE : 2/14/14

TIME : 16:38: 3

RECEPTOR - LINK MATRIX FOR THE ANGLE PRODUCING

THE MAXIMUM CONCENTRATION FOR EACH RECEPTOR

	* CO/LINK (PPM)																			
	* ANGLE (DEGREES)																			
	* REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15	REC16	REC17	REC18	REC19	REC20
LINK #	* 80	80	80	10	10	10	350	350	340	300	300	180	190	260	260	260	100	100	100	170
-------*	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------
1	* 0.1	0.1	0.1	0.0	0.0	0.0	0.3	0.2	0.2	0.1	0.0	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.3
2	* 0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	* 0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	* 0.0	0.0	0.0	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2

5	*	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0
6	*	0.2	0.2	0.2	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.3	0.2	0.3	0.4	0.0
7	*	0.2	0.2	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.0	0.0	0.0	0.1
8	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	*	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.3	0.3	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.1	0.1	0.0
10	*	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
11	*	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.4	0.3	0.2	0.3	0.2	0.0	0.1
12	*	0.2	0.3	0.3	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.1	0.1	0.0	0.0	0.0	0.2	0.2	0.2	0.0
13	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
19	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

```
      20  *   0.1   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
0.0

      21  *   0.0   0.1   0.1   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
0.0

      22  *   0.0   0.0   0.0   0.1   0.1   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
0.0

      23  *   0.0   0.0   0.0   0.0   0.0   0.1   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
0.0

      24  *   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
0.0
```

JOB: YTI PP 2017 - Henry Ford/Anaheim RUN: Peak Hour CO - Year 2017

DATE : 2/14/14

TIME : 16:38: 3

RECEPTOR - LINK MATRIX FOR THE ANGLE PRODUCING

THE MAXIMUM CONCENTRATION FOR EACH RECEPTOR

```
        *    CO/LINK  (PPM)
        *    ANGLE (DEGREES)
        *  REC21
LINK # *   180
-------*------
    1  *   0.1
    2  *   0.0
    3  *   0.0
    4  *   0.2
    5  *   0.0
    6  *   0.0
    7  *   0.1
    8  *   0.0
```

```
 9  *   0.0
10  *   0.1
11  *   0.1
12  *   0.0
13  *   0.1
14  *   0.0
15  *   0.0
16  *   0.1
17  *   0.0
18  *   0.0
19  *   0.0
20  *   0.0
21  *   0.0
22  *   0.0
23  *   0.0
24  *   0.0
```

CAL3QHC Model Output

Henry Ford Ave. and Anaheim St.
Proposed Project without Mitigation - 2026

JOB: YTI PP 2026 - Henry Ford/Anaheim RUN: Peak Hour CO - Year 2026

DATE : 2/14/14

TIME : 16:38: 3

The MODE flag has been set to C for calculating CO averages.

SITE & METEOROLOGICAL VARIABLES

VS = 0.0 CM/S VD = 0.0 CM/S Z0 = 100. CM

U = 1.0 M/S CLAS = 6 (F) ATIM = 60. MINUTES MIXH = 1000. M AMB = 0.0 PPM

LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (FT)				*	LENGTH	BRG	TYPE	VPH	EF	H	W	V/C	QUEUE
	*	X1	Y1	X2	Y2	*	(FT)	(DEG)			(G/MI)	(FT)	(FT)		(VEH)
1. NBTR	*	33.0	-500.0	25.0	0.0	*	500.	359.	AG	1402.	2.8	0.0	56.0		
2. NBL	*	20.0	-500.0	4.0	0.0	*	500.	358.	AG	195.	2.5	0.0	44.0		

3.	SBL	*	-6.0	500.0	7.0	-12.0	*	512.	179.	AG	152.	2.5	0.0	32.0
4.	SBTR	*	-15.0	-12.0	-17.0	500.0	*	512.	360.	AG	1129.	2.8	0.0	56.0
5.	WBL	*	0.0	-7.0	500.0	6.0	*	500.	89.	AG	237.	2.8	0.0	32.0
6.	WBTR	*	0.0	12.0	500.0	12.0	*	500.	90.	AG	1225.	2.8	0.0	56.0
7.	EBT	*	-500.0	-31.0	12.0	-26.0	*	512.	89.	AG	883.	2.8	0.0	44.0
8.	EBL	*	-500.0	-24.0	12.0	-5.0	*	512.	88.	AG	75.	2.8	0.0	32.0
9.	NBD	*	25.0	0.0	25.0	500.0	*	500.	360.	AG	1340.	2.8	0.0	44.0
10.	SBD	*	-12.0	-500.0	-15.0	-12.0	*	488.	360.	AG	1346.	1.4	0.0	56.0
11.	WBD	*	-500.0	12.0	0.0	12.0	*	500.	90.	AG	1311.	2.8	0.0	44.0
12.	EBD	*	12.0	-26.0	500.0	-22.0	*	488.	90.	AG	1301.	2.8	0.0	44.0
13.	NBAX	*	33.0	-2000.0	33.0	-500.0	*	1500.	360.	AG	1597.	1.0	0.0	56.0
14.	NBDX	*	25.0	500.0	25.0	2000.0	*	1500.	360.	AG	1340.	1.0	0.0	44.0
15.	SBAX	*	-17.0	500.0	-17.0	2000.0	*	1500.	360.	AG	1281.	1.0	0.0	56.0
16.	SBDX	*	-20.0	-2000.0	-18.0	-500.0	*	1500.	0.	AG	2235.	1.0	0.0	56.0
17.	WBDX	*	-2000.0	12.0	-500.0	12.0	*	1500.	90.	AG	1311.	1.0	0.0	44.0
18.	EBAX	*	-2000.0	-31.0	-500.0	-31.0	*	1500.	90.	AG	1847.	1.0	0.0	44.0
19.	EBDX	*	500.0	-22.0	2000.0	-22.0	*	1500.	90.	AG	1301.	1.0	0.0	44.0
20.	EBRX1	*	-500.0	-38.0	-132.0	-42.0	*	368.	91.	AG	889.	1.1	0.0	32.0
21.	EBRX2	*	-132.0	-42.0	-55.0	-64.0	*	80.	106.	AG	889.	1.1	0.0	32.0
22.	EBRX3	*	-55.0	-64.0	-39.0	-137.0	*	75.	168.	AG	889.	1.1	0.0	32.0
23.	EBRX4	*	-39.0	-137.0	-32.0	-500.0	*	363.	179.	AG	889.	1.1	0.0	32.0
24.	WBAX	*	500.0	12.0	2000.0	12.0	*	1500.	90.	AG	1462.	1.0	0.0	44.0

JOB: YTI PP 2026 - Henry Ford/Anaheim RUN: Peak Hour CO - Year 2026

DATE : 2/14/14

TIME : 16:38: 3

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE

RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (FT) X	Y	Z
1. R01	-197.0	-58.0	5.9
2. R02	-146.0	-58.0	5.9
3. R03	-101.0	-67.0	5.9
4. R04	-64.0	-106.0	5.9
5. R05	-56.0	-142.0	5.9

6. R06	*	-55.0	-191.0	5.9	*
7. R07	*	62.0	-216.0	5.9	*
8. R08	*	60.0	-134.0	5.9	*
9. R09	*	60.0	-62.0	5.9	*
10. R10	*	132.0	-62.0	5.9	*
11. R11	*	214.0	-62.0	5.9	*
12. R12	*	58.0	200.0	5.9	*
13. R13	*	58.0	118.0	5.9	*
14. R14	*	58.0	46.0	5.9	*
15. R15	*	130.0	46.0	5.9	*
16. R16	*	212.0	46.0	5.9	*
17. R17	*	-199.0	44.0	5.9	*
18. R18	*	-117.0	44.0	5.9	*
19. R19	*	-45.0	44.0	5.9	*
20. R20	*	-45.0	116.0	5.9	*
21. R21	*	-45.0	198.0	5.9	*

JOB: YTI PP 2026 - Henry Ford/Anaheim RUN: Peak Hour CO - Year 2026

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-360.

WIND ANGLE (DEGR)	* CONCENTRATION (PPM) *	REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15	REC16	REC17	REC18	REC19	REC20
0.	*	0.2	0.2	0.2	0.3	0.2	0.1	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.2	0.3
10.	*	0.2	0.2	0.3	0.5	0.5	0.3	0.0	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4
20.	*	0.3	0.4	0.4	0.4	0.3	0.3	0.1	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.3

30.	*	0.4	0.4	0.4	0.2	0.3	0.4	0.1	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.3	0.3
40.	*	0.4	0.4	0.4	0.3	0.4	0.4	0.1	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2
50.	*	0.4	0.4	0.4	0.4	0.4	0.4	0.2	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2
60.	*	0.3	0.3	0.2	0.4	0.4	0.4	0.1	0.2	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2
70.	*	0.4	0.2	0.4	0.3	0.4	0.3	0.0	0.2	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2
80.	*	0.3	0.5	0.4	0.2	0.2	0.2	0.0	0.0	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2
90.	*	0.2	0.3	0.2	0.1	0.2	0.2	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.2	0.2	0.2	0.2	0.3	0.4	0.2
100.	*	0.1	0.1	0.1	0.1	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.3	0.3	0.4	0.6	0.5	0.3
110.	*	0.1	0.1	0.1	0.1	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.3	0.3	0.4	0.5	0.5	0.4
120.	*	0.1	0.1	0.1	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.3	0.4	0.3	0.5	0.4
130.	*	0.1	0.1	0.1	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.5	0.4
140.	*	0.1	0.1	0.1	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4
150.	*	0.0	0.1	0.2	0.2	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.3	0.4	0.4	0.5
160.	*	0.0	0.0	0.2	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.4	0.6	0.3
170.	*	0.1	0.1	0.2	0.3	0.3	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.3	0.3	0.5	0.5

```
 180.  *   0.0   0.0   0.1   0.1   0.2   0.2   0.3   0.4   0.4   0.0   0.0   0.1   0.5   0.6   0.2   0.2   0.2   0.2   0.4
0.4

 190.  *   0.0   0.0   0.0   0.0   0.0   0.0   0.4   0.4   0.5   0.1   0.0   0.4   0.5   0.6   0.4   0.3   0.2   0.2   0.2
0.1

 200.  *   0.0   0.0   0.0   0.0   0.0   0.0   0.3   0.3   0.3   0.1   0.0   0.3   0.5   0.5   0.3   0.3   0.2   0.2   0.2
0.1

 210.  *   0.0   0.0   0.0   0.0   0.0   0.0   0.3   0.3   0.3   0.1   0.1   0.4   0.3   0.5   0.3   0.3   0.2   0.2   0.2
0.1

 220.  *   0.0   0.0   0.0   0.0   0.0   0.0   0.3   0.3   0.2   0.1   0.1   0.3   0.3   0.3   0.3   0.3   0.2   0.2   0.2
0.1

 230.  *   0.0   0.0   0.0   0.0   0.0   0.0   0.1   0.1   0.1   0.1   0.1   0.3   0.3   0.3   0.3   0.3   0.2   0.2   0.2
0.1

 240.  *   0.0   0.0   0.0   0.0   0.0   0.0   0.1   0.1   0.1   0.1   0.1   0.3   0.4   0.5   0.4   0.4   0.3   0.3   0.3
0.2

 250.  *   0.0   0.0   0.0   0.0   0.0   0.0   0.1   0.1   0.1   0.1   0.1   0.3   0.4   0.6   0.4   0.3   0.3   0.3   0.3
0.1

 260.  *   0.0   0.0   0.0   0.0   0.0   0.0   0.1   0.1   0.1   0.1   0.1   0.2   0.4   0.5   0.5   0.4   0.3   0.4   0.4
0.1

 270.  *   0.3   0.3   0.2   0.0   0.0   0.0   0.1   0.1   0.3   0.3   0.2   0.2   0.2   0.3   0.3   0.3   0.2   0.2   0.1
0.0

 280.  *   0.4   0.4   0.3   0.1   0.1   0.1   0.1   0.1   0.4   0.4   0.4   0.2   0.2   0.2   0.2   0.1   0.0   0.0   0.0
0.0

 290.  *   0.3   0.3   0.3   0.2   0.2   0.0   0.1   0.3   0.3   0.3   0.4   0.2   0.2   0.2   0.2   0.0   0.0   0.0   0.0
0.0

 300.  *   0.3   0.3   0.2   0.2   0.2   0.1   0.2   0.3   0.4   0.3   0.4   0.2   0.2   0.2   0.2   0.1   0.0   0.0   0.0
0.0

 310.  *   0.2   0.2   0.2   0.2   0.2   0.1   0.2   0.3   0.4   0.4   0.3   0.2   0.2   0.2   0.2   0.1   0.0   0.0   0.0
0.0

 320.  *   0.2   0.2   0.2   0.2   0.2   0.1   0.3   0.4   0.3   0.4   0.3   0.2   0.2   0.2   0.2   0.1   0.0   0.0   0.0
0.0
```

```
 330.  *   0.2   0.2   0.2   0.2   0.1   0.1   0.3   0.4   0.5   0.4   0.4   0.3   0.3   0.3   0.2   0.1   0.0   0.0   0.0
0.0

 340.  *   0.2   0.2   0.2   0.2   0.1   0.0   0.3   0.4   0.6   0.4   0.3   0.3   0.3   0.3   0.2   0.0   0.0   0.0   0.0
0.0

 350.  *   0.2   0.2   0.2   0.2   0.1   0.0   0.4   0.6   0.6   0.3   0.2   0.2   0.3   0.4   0.0   0.0   0.0   0.0   0.0
0.0

 360.  *   0.2   0.2   0.2   0.3   0.2   0.1   0.2   0.3   0.3   0.2   0.2   0.2   0.2   0.1   0.0   0.0   0.0   0.0   0.2
0.3

 ------*-------------------------------------------------------------------------------------------------------------------
-

 MAX   *   0.4   0.5   0.4   0.5   0.5   0.4   0.4   0.6   0.6   0.4   0.4   0.4   0.5   0.6   0.5   0.4   0.4   0.6   0.6
0.5

 DEGR. *   30    80    20    10    10    30   190   350   340   280   280   190   180   180   260   240   100   100   160   150
```

JOB: YTI PP 2026 - Henry Ford/Anaheim RUN: Peak Hour CO - Year 2026

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-360.

WIND ANGLE (DEGR)	CONCENTRATION (PPM) REC21
0.	0.2
10.	0.3
20.	0.3
30.	0.3
40.	0.2
50.	0.2

```
 60.  *   0.2
 70.  *   0.2
 80.  *   0.2
 90.  *   0.2
100.  *   0.2
110.  *   0.2
120.  *   0.4
130.  *   0.4
140.  *   0.3
150.  *   0.4
160.  *   0.4
170.  *   0.4
180.  *   0.3
190.  *   0.1
200.  *   0.0
210.  *   0.1
220.  *   0.1
230.  *   0.1
240.  *   0.1
250.  *   0.0
260.  *   0.0
270.  *   0.0
280.  *   0.0
```

```
290.  *   0.0

300.  *   0.0

310.  *   0.0

320.  *   0.0

330.  *   0.0

340.  *   0.0

350.  *   0.0

360.  *   0.2

------*------

MAX   *   0.4

DEGR. *  120


THE HIGHEST CONCENTRATION OF    0.60 PPM OCCURRED AT RECEPTOR REC18.
```

JOB: YTI PP 2026 - Henry Ford/Anaheim RUN: Peak Hour CO - Year 2026

DATE : 2/14/14

TIME : 16:38: 3

RECEPTOR - LINK MATRIX FOR THE ANGLE PRODUCING

THE MAXIMUM CONCENTRATION FOR EACH RECEPTOR

	* CO/LINK (PPM)																			
	* ANGLE (DEGREES)																			
	* REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15	REC16	REC17	REC18	REC19	REC20
LINK # *	30	80	20	10	10	30	190	350	340	280	280	190	180	180	260	240	100	100	160	150
-------*	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------
1 *	0.0	0.1	0.0	0.0	0.0	0.1	0.3	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.0	0.1	0.0	0.0	0.2	0.1
2 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4 *	0.1	0.0	0.1	0.2	0.2	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1

5	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	*	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.1	0.2	0.0	0.1
7	*	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0
8	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	*	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.2	0.2	0.0	0.0	0.2	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.1
10	*	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
11	*	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.2	0.0	0.2	0.1	0.1	0.0
12	*	0.0	0.2	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.1
13	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
14	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16	*	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
17	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

```
      20  *   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
0.0

      21  *   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
0.0

      22  *   0.0   0.0   0.0   0.0   0.1   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
0.0

      23  *   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
0.0

      24  *   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
0.0
```

JOB: YTI PP 2026 - Henry Ford/Anaheim RUN: Peak Hour CO - Year 2026

DATE : 2/14/14

TIME : 16:38: 3

RECEPTOR - LINK MATRIX FOR THE ANGLE PRODUCING

THE MAXIMUM CONCENTRATION FOR EACH RECEPTOR

```
        *    CO/LINK  (PPM)
        *    ANGLE (DEGREES)
        *  REC21
LINK # *   120
-------*------
    1  *   0.0
    2  *   0.0
    3  *   0.0
    4  *   0.1
    5  *   0.0
    6  *   0.1
    7  *   0.0
    8  *   0.0
```

```
 9  *   0.1
10  *   0.0
11  *   0.0
12  *   0.1
13  *   0.0
14  *   0.0
15  *   0.0
16  *   0.0
17  *   0.0
18  *   0.0
19  *   0.0
20  *   0.0
21  *   0.0
22  *   0.0
23  *   0.0
24  *   0.0
```

Attachment B2.2

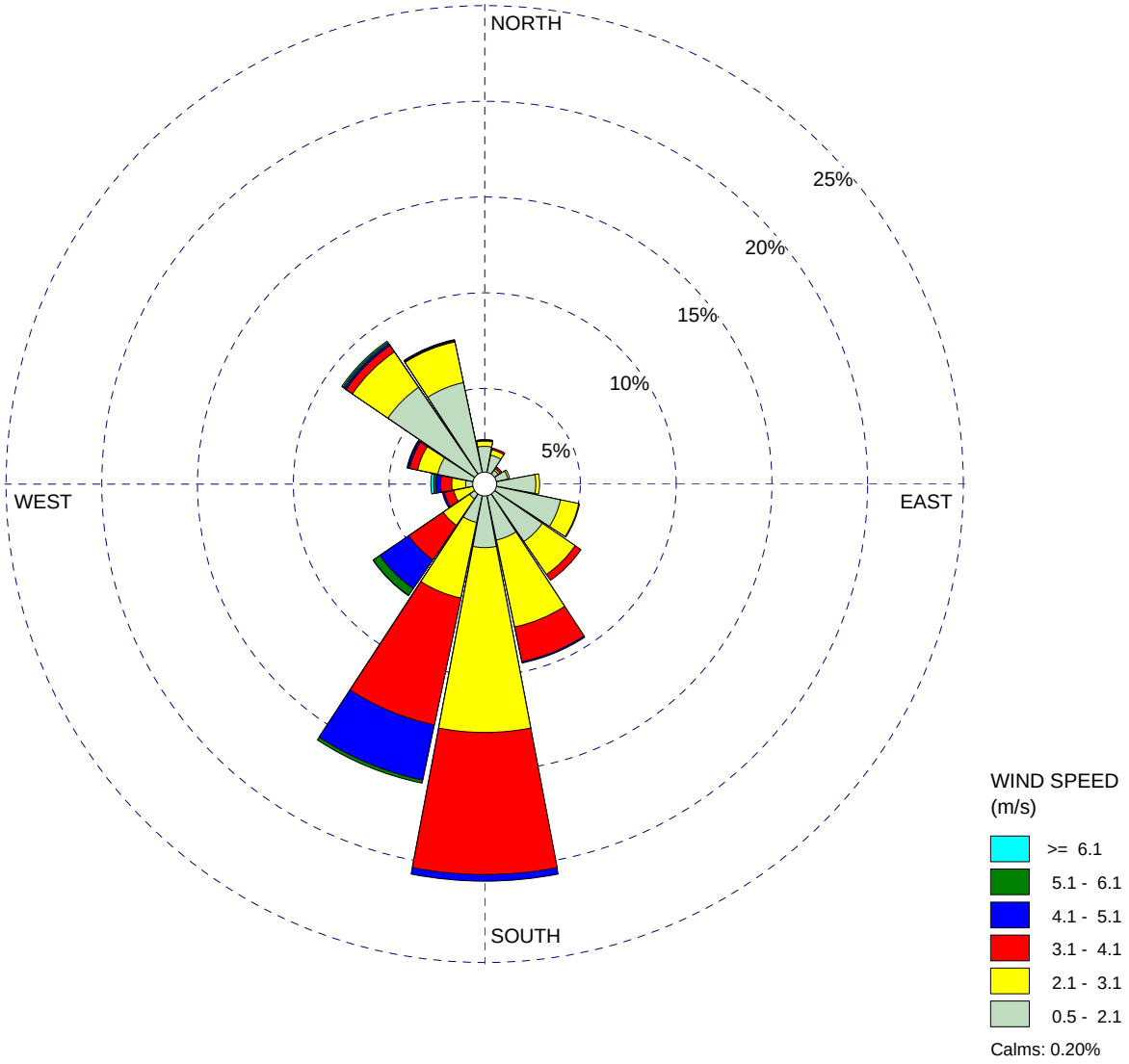
Wind Rose Diagram

WIND ROSE PLOT:

Port of Los Angeles Wind Rose
YTI Terminal Modeling

DISPLAY:

Wind Speed
Direction (blowing from)



COMMENTS:	DATA PERIOD:	COMPANY NAME: ENVIRON	
	Start Date: 9/1/2006 - 07:00 **End Date: 8/31/2007 - 17:00**	MODELER:	
	CALM WINDS: **0.20%**	TOTAL COUNT: **4015 hrs.**	
	AVG. WIND SPEED: **2.40 m/s**	DATE: **2/28/2014**	PROJECT NO.:

WRPLOT View - Lakes Environmental Software

Appendix B3
Health Risk Assessment

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1.0 Introduction

This appendix describes the methods and results of a health risk assessment (HRA) that evaluates potential public health effects from toxic air contaminant (TAC) emissions that would be generated during the construction and operation of the proposed Project and alternatives for the Berths 212-214 (YTI) Container Terminal. The HRA evaluated health risks associated with the following scenarios:

- Notice of Preparation (NOP) CEQA Baseline (January1, 2012 through December 31, 2012) – baseline at the time of the NOP;
- Future CEQA Baseline – used only in the evaluation of cancer risk and cancer burden, as described in Section 2.3.2;
- NEPA Baseline – equivalent to Alternative 2 without mitigation;
- Proposed Project without and with mitigation;
- Alternative 1, No Project without mitigation;
- Alternative 2, No Federal Action, without and with mitigation; and
- Alternative 3, Reduced Project, without and with mitigation.

The HRA was conducted in accordance with a Protocol prepared previously by the Port and reviewed and approved by both CARB and SCAQMD (LAHD 2005). The Port protocol is based on the methodology in OEHHA's Air Toxics Hot Spots Program Risk Assessment Guidelines (OEHHA 2003), Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics "Hot Spots" Information and Assessment Act (AB2588) (SCAQMD 2011a), and Health Risk Assessment Guidance for Analyzing Cancer Risks from Mobile Source Diesel Emissions (SCAQMD 2003). The Hotspots Analysis and Reporting Program (HARP) model Version 1.4f (CARB 2012) used in the HRA incorporates the methods in these guidance documents.

The HRA analyzed proposed Project and alternative TAC emissions and human exposure to the TAC emissions during the 70-year period from 2015 to 2084. TACs are compounds that are known or suspected to cause adverse health effects after short-term (acute) or long-term (chronic) exposure. The HRA includes an evaluation of four different types of health effects: individual lifetime cancer risk, cancer burden, chronic noncancer hazard index, and acute noncancer hazard index.

The HRA was developed using a five-step process to estimate incremental health impact results: (1) quantify proposed Project, alternative, and baseline emissions; (2) identify ground-level receptor locations that may be affected by emissions, including a regular receptor grid as well as specific sensitive receptor locations nearby such as schools, hospitals, convalescent homes, or daycare centers; (3) perform dispersion modeling analyses to estimate ambient TAC concentrations at each receptor location; (4) characterize the potential health risk at each receptor location; and (5) evaluate incremental health risk values by comparing potential health risk posed by the proposed Projects relative to CEQA and NEPA baselines. The following sections provide additional details on the methods used to complete each step of the HRA.

2.0 Emissions Development

2.1 Construction Emission Sources

The following emission sources associated with onsite construction activities were included in the HRA:

- Off-road construction equipment: land-based equipment and marine-based equipment (dredging and pile driving equipment);
- On-road construction vehicles (haul trucks, delivery trucks);
- Crane delivery ship used to deliver shore-side gantry cranes;
- Harbor craft: tugboats (used to position dredging barges and scows) and dive boats; and
- Asphalt paving: fugitive VOC emissions.

In accordance with SCAQMD guidance (SCAQMD 2005), only onsite construction emissions were included in the HRA. Construction emissions were not modeled for the CEQA baseline and Alternative 1 because those scenarios would have no construction activities.

2.2 Operational Emission Sources

Both on-site and off-site emission sources were included in the modeling of operational emissions. The following emission sources associated with operational activities were included in the HRA:

- Container ships transiting to and from berth. Ship transit emission sources are comprised of propulsion and auxiliary engines and boiler exhaust. Ship transit in SCAQMD waters consists of transit in the fairway, precautionary zone, and the harbor. Ships transiting were modeled as far as the SCAB overwater boundary, approximately 40 nautical miles.

- Container ships hoteling while at berth and at anchorage in the harbor. Ship hoteling emission sources are comprised of ship auxiliary engines (except when using AMP) and boiler exhaust; propulsion engines would be turned off.

- Tugboats used to assist container ships between the Port breakwater and the berth. Two tugboats were assumed to assist each ship. Tugboat emission sources are comprised of propulsion and auxiliary engines.

- On-road trucks driving on near-Port roads, at the YTI terminal, and idling on-terminal and at the YTI terminal gate. Truck transit emission sources are comprised of exhaust, brake wear, and tire wear. Trucks were modeled as far as approximately 3 miles north of the terminal, a distance established in prior LAHD NEPA/CEQA documents as sufficient to capture maximum concentrations for container terminal projects (LAHD 2011a).

- Locomotives switching and idling at the TICTF on-dock rail yard, and line haul locomotives pulling trains between the TICTF on-dock rail yard and the Alameda

Corridor. Locomotives traveling were modeled as far as approximately 3 miles north of the terminal.

- Cargo handling equipment (CHE) operating at the YTI terminal and TICTF, including forklifts, rubber-tired gantry cranes, top handlers, and yard tractors.

- Transport refrigeration units (TRUs) operating at the TICTF.

- Worker vehicles driving to and from the YTI terminal. Worker vehicle emission sources are comprised of exhaust, brake wear, and tire wear. Worker vehicles were modeled as far as approximately 3 miles north of the terminal.

2.3 Emission Calculation Approach

2.3.1 Averaging Periods for TAC Emissions

The following averaging periods were used to determine toxic air contaminant emission rates for the NEPA baseline, proposed Project, and alternatives:

- Annual emission rates averaged over a 70-year exposure period (2015-2084) were used to determine cancer risk for residential, recreational, and sensitive receptors. To estimate annual average TAC emissions over the 70-year exposure period, equipment activity levels were interpolated between analysis years (2015, 2016, 2017, 2020, and 2026) and held constant at 2026 levels for all years beyond 2026. Similarly, emission factors were interpolated between evaluation years and held constant after the last available emission factor evaluation year.

- Annual emission rates averaged over a 40-year exposure period (2015-2054) were used to determine cancer risk for occupational receptors. The approach for calculating a 40-year average is similar to that described above for the 70-year average.

- Maximum annual emission rates were used to determine chronic hazard indices for all receptor types. The maximum emissions were selected from the project analysis years 2015, 2016, 2017, 2020, and 2026. To ensure the capture of maximum TAC concentrations in the HRA, maximum annual emissions were modeled for each emission source category, even if the maximum emissions would not occur in the same analysis year. For example, maximum construction emissions were determined separately for diesel exhaust and all other sources. These maximum emissions were conservatively modeled together in the HRA even if they would occur during different construction analysis years. Similarly, maximum operational emissions were determined separately for automobile diesel exhaust, all other automobile emissions, cargo handling equipment, harborcraft, line haul locomotives, OGV boilers during anchorage, OGV diesel exhaust during anchorage, OGV boilers during hoteling, OGV diesel exhaust during hoteling, OGV boilers during transit, OGV diesel exhaust during transit, truck diesel exhaust, all other truck emissions, transport refrigeration units, and yard locomotives. These maximum emissions were conservatively modeled

together in the HRA even if they would occur during different analysis years.

- Peak 1-hour emission rates were used to determine acute hazard indices for all receptor types. The peak emissions were selected from the project analysis years 2015, 2016, 2017, 2020, and 2026. To ensure the capture of maximum TAC concentrations in the HRA, peak 1-hour emissions were modeled for each emission source category, even if the maximum emissions would not occur simultaneously. The approach for selecting peak 1-hour emission rates by source category is similar to that described above for maximum annual emission rates.

2.3.2 CEQA Baseline

A primary and a secondary methodology were used to develop the CEQA baseline TAC emissions. The primary approach is referred to as the NOP CEQA baseline, and the secondary approach is referred to as the Future CEQA baseline. The NOP CEQA baseline was used in the evaluation of all health effects in this HRA (cancer risk, cancer burden, chronic and acute noncancer effects). The Future CEQA baseline was used only in the evaluation of cancer risk and cancer burden.

To better apprise the public and decision makers of the Project's environmental impacts under CEQA, the predicted cancer risk and cancer burden for the proposed Project and alternatives are compared to both the NOP CEQA baseline and the Future CEQA baseline. The NOP CEQA baseline uses 2012 YTI terminal activity levels and 2012 emission factors; in other words, it represents actual 2012 operational emissions. The Future CEQA baseline also uses 2012 YTI terminal activity levels, but uses emission factors averaged over a 70-year exposure period (2012-2081) for residential cancer risk, or a 40 year exposure period (2012-2051) for occupational cancer risk. These long-term average emission factors incorporate the effects of existing air quality regulations on future equipment emissions.

The NOP CEQA baseline cancer risk is typically higher than the Future CEQA baseline cancer risk, because emission factors for port-related equipment generally decline over time in response to existing air quality regulations and assumptions regarding equipment fleet turnover. This declining trend in emissions is accounted for in the Future CEQA baseline but not the NOP CEQA baseline.

The Future CEQA baseline is not used in the evaluation of chronic and acute noncancer effects. Chronic and acute noncancer effects are based on annual and hourly emissions, respectively. These emission periods occur entirely within the 2012 baseline year, and therefore are represented by the NOP CEQA baseline.

2.4 Project Emission Trends

The extended period of analysis (up to 70 years for cancer risk) required predictions of the future operational characteristics of the proposed emission sources. Two of the more important factors that would affect future emissions from Project sources and that were integrated into the analysis are:

- Reductions in emission factors due to (a) the incidental phase-in of cleaner vehicles or equipment due to normal fleet turnover; (b) the future phase-in of cleaner fuels as required by existing regulations or agreements; and (c) the future phase-in of cleaner engines as required by existing regulations or agreements.

- Increased vehicle and equipment activity levels due to anticipated increases in container throughput.

These two opposing trends that influence future year emission calculations are discussed in the following sections.

2.4.1 Emission Factor Trends

The methodology for determining emission factors for each emission source category is described in Section 3.2.4.1 of the EIS/EIR and in Appendix B1, and therefore is not reproduced in this appendix. The following summarizes long-term emission factor trends pertinent to the HRA:

- **Off-road Construction Equipment.** Emission factors were derived from the CARB Off-road 2011 Emissions Inventory Database for equipment representative of the SCAB (CARB 2011a). The CARB database output shows that, on a per-horsepower-hour basis, emission factors will steadily decline in future years as older equipment is replaced with newer, cleaner equipment that meets the already-adopted future state and federal off-road engine emission standards.
- **On-Road Construction Vehicles.** Emission factors were generated by the EMFAC2011 on-road mobile source emission factor model for a truck fleet representative of the SCAB (CARB 2011a). The EMFAC2011 model output shows that, on a per-mile basis, emission factors will steadily decline in future years as older trucks are replaced with newer, cleaner trucks that meet the required state and federal on-road engine emission standards.
- **Crane Delivery Ships.** Emission factors were obtained from the 2012 Port Emissions Inventory (Port EI) (LAHD 2012a). The emission factors were assumed to remain constant during both construction years.
- **Harbor Craft.** Emission factors were derived based on the USEPA standards for marine compression-ignition engines. Emission factors were assumed to remain constant during the construction period, but would steadily decline in future operational years as older tugboats are replaced with newer, cleaner tugboats per required state regulations.

- **Container Ships.** Emission factors were obtained from the 2012 Port EI (LAHD 2012a). Emission factors for propulsion and auxiliary engines are dependent on engine tier, which in turn is dependent upon engine age. Starcrest provided the average age of vessels that called at the YTI terminal in 2012. Since most of the vessels were on average 10 years old, emission factors corresponding to IMO Tier 1 for slow speed diesel propulsion engines (model years 2000 to 2010) and IMO Tier 1 for medium speed diesel auxiliary engines were used in the analysis. Since there is no confirmation that newer ships would visit the terminal in future years, engine emission factors were assumed to remain constant in future years. Per CARB regulatory requirements, the sulfur content of fuel was assumed to

decrease from 0.5% in the baseline year to 0.1% in future years, thereby resulting in diesel particulate matter (DPM) reduction (CARB 2011b). In addition, container ships were assumed to comply with increasing requirements per CARB's shore power regulation, thereby reducing DPM emissions while hoteling at berth (CARB 2007).

- **On-Road Container Trucks.** Emission factors were generated by the EMFAC2011 on-road mobile source emission factor model (CARB 2011a). EMFAC2011 was run by Starcrest using the Port fleet mix for the baseline and future proposed Project and alternative years. Emission factors of PM10 exhaust are predicted to rise slightly above 2012 levels in future years as the fleet – which contained a large percentage of new trucks in 2012 because of the Port's Clean Truck Program – ages and reaches equilibrium with regard to fleet turnover. The percentage of container trucks using alternative fuels was conservatively assumed to remain at 10 percent for all future years even though it is likely that percentage will rise, resulting in a lower cancer risk.
- **Locomotives.** Line haul locomotive emission factors were obtained from the USEPA (USEPA 2009) and assume a gradual replacement of older locomotives with cleaner, newer locomotives in the future. The emission factors for PHL switch locomotives at the on-dock rail yard were based on PHL's 2012 switch engine fleet and fleet turnover assumptions for future project analysis years. As a result, the emission factors for PHL and line haul locomotives are predicted to decline in future years.
- **CHE.** Emission factors were derived from CARB's CHE inventory model (CARB 2011a). Emission factors will steadily decline in future years as older equipment are replaced with newer, cleaner equipment that meet the required state and federal off-road engine emission standards.
- **TRUs.** DPM emission factors were obtained from CARB's TRU inventory (CARB 2011a); VOC emission factors were obtained from CalEEMod (CAPCOA 2013). Emission factors will steadily decline in future years as older equipment are replaced with newer, cleaner equipment that meet the required state and federal off-road engine emission standards.
- **Worker Vehicles.** Emission factors were derived from EMFAC2011 (CARB 2011a). EMFAC2011 shows that emission factors will steadily decline in future years as older vehicles are replaced with newer, cleaner vehicles that meet the required state and federal vehicle engine emission standards.
- **Asphalt Paving.** The VOC off-gas emission factor for asphalt paving was obtained from CalEEMod (CAPCOA 2013). The emission factor per acre paved was assumed to remain constant during the construction period.

2.4.2 Activity Level Trends

Examples of activity levels include the container throughput at the terminal, the number of train and truck trips needed to move the containers, on-site equipment usage, truck/vehicle miles

traveled (VMT), and truck travel speeds. For the NOP CEQA baseline and Future CEQA baseline scenarios, 2012 throughput levels were used and held constant over the entire 70-year analysis period. Activity levels for each emission source category are presented in Section 3.2.4.1 in the EIS/EIR and in Appendix B1.

YTI provided the facility throughput and container ship activity used in the HRA. The transportation study (Appendix D) provided the train, truck, and worker trip data used in the HRA. Tugboat activity would increase with the increase in container ships. CHE and TRU activity would increase with projected container throughput increase. The following summarizes the trends in future activity levels for the proposed Project and alternatives:

- Proposed Project: Terminal throughput would increase from 996,109 twenty-foot equivalent units (TEU) in the 2012 baseline year to 1,913,000 TEU in the final analysis year, 2026. Overall ship calls would increase from 162 ship calls in 2012 to 206 ship calls in 2026, and larger ships would be accommodated at the terminal in the future. Annual train trips to and from the on-dock rail yard would increase from 725 trains per year in 2012 to 1,269 trains per year in 2026. The average train length was assumed to increase from 8,000 feet per train in 2012 to 8,660 feet per train in 2026, requiring proportionally more locomotives per train. Annual truck trips would increase from 907,176 trips per year in 2012 to 1,347,939 trips per year in 2026.

- Alternative 1, Alternative 2, and NEPA Baseline: Terminal throughput would increase from 996,109 twenty-foot equivalent units (TEU) in the 2012 baseline year to 1,692,000 TEU in the final analysis year, 2026. Overall ship calls would not increase and larger ships would be accommodated at the terminal in the future. Annual train trips to and from the on-dock rail yard would increase from 725 trains per year in 2012 to 1,075 trains per year in 2026. The average train length was assumed to increase from 8,000 feet per train in 2012 to 8,660 feet per train in 2026, requiring proportionally more locomotives per train. Annual truck trips would increase from 907,176 trips per year in 2012 to 1,222,690 trips per year in 2026.

- Alternative 3: Terminal throughput would increase from 996,109 twenty-foot equivalent units (TEU) in the 2012 baseline year to 1,913,000 TEU in the final analysis year, 2026. Overall ship calls would increase from 162 ship calls in 2012 to 232 ship calls in 2026, and larger ships would not be accommodated at the terminal in the future. Annual train trips to and from the on-dock rail yard would increase from 725 trains per year in 2012 to 1,269 trains per year in 2026. The average train length was assumed to increase from 8,000 feet per train in 2012 to 8,660 feet per train in 2026, requiring proportionally more locomotives per train. Annual truck trips would increase from 907,176 trips per year in 2012 to 1,347,939 trips per year in 2026.

2.4.3 TAC Emission Rates

Diesel internal combustion engines (ICEs) represent the biggest source of TAC emissions associated with the proposed Project and alternatives. Diesel ICEs include construction equipment, ship propulsion and auxiliary engines, harborcraft, diesel container trucks,

locomotives, CHE, and TRUs. For the determination of cancer risk and chronic hazard indices, OEHHA and CARB use DPM from ICEs as a surrogate for total diesel exhaust. The inhalation cancer potency factor and chronic non-cancer reference exposure level (REL) for DPM, established by OEHHA and CARB, account for the individual toxic species contained in total diesel ICE exhaust. Therefore, it was not necessary to further speciate diesel ICE exhaust into its chemical components for the determination of cancer risk and chronic noncancer hazard indices.

Sources other than diesel ICEs include ship boilers, tire and brake wear, alternative-fueled trucks, gasoline worker vehicles, and asphalt paving off-gas. For these sources, total organic gas (TOG) and PM10 emissions were speciated into their individual TAC components for the determination of cancer risk and chronic hazard indices. Speciation profiles were based on those developed by CARB (CARB 2014). Table 2-1 presents the speciation profiles that were used to convert PM10 emissions into individual TACs. Table 2-2 presents the speciation profiles that were used to convert TOG emissions into individual TACs.

OEHHA and CARB have not established an acute REL for DPM. Therefore, peak 1-hour TOG and PM10 emissions from all sources, including diesel ICEs, were speciated into their individual TAC components for the determination of acute hazard indices.

Table 2-1. Speciation Profiles for PM10

		Weight Percent							
Toxic Air Contaminant	**HARP TAC ID**	**Profile 112 Ship Boilers**	**Profile 114 Ship Aux. Engines [a]**	**Profile 119 Harbor-craft [a]**	**Profile 123 Alt. Fuel Engines**	**Profile 425 Diesel IC Engines [a]**	**Profile 472 Tire Wear**	**Profile 473 Brake Wear**	**Profile 400 Gasoline Autos**
Ammonia	7664417	--	--	--	--	0.34	0.019	0.003	--
Arsenic	7440382	0.54	0.54	--	--	0.0005	--	0.001	--
Cadmium	7440439	0.05	0.05	--	--	0.004	--	--	--
Chlorine	7782505	--	--	--	--	--	0.78	0.15	7
Copper	7440508	--	--	--	0.05	0.0025	0.049	1.15	0.05
Hexavalent Chromium [b]	18540299	0.027	0.027	--	0.0025	0.00006	0.00015	0.006	0.0025
Lead	7439921	0.55	0.55	--	--	0.0042	0.016	0.005	--
Manganese	7439965	--	--	--	0.05	0.004	0.01	0.17	0.05
Mercury	7439976	--	--	--	--	0.003	--	--	--
Nickel	7440020	0.05	0.05	--	0.05	0.0019	0.005	0.066	0.05
Selenium	7782492	0.05	0.05	--	--	0.001	0.002	0.002	--
Sulfates	9960	25	25	15	45	1.74	0.25	--	45
Vanadium	7440622	--	--	0.55	--	0.0029	--	0.066	--
Applicable sources:		Ship boilers	Ship aux. engines	Tugboats, construction harborcraft	LNG trucks	Ship main engines, locomotives, CHE, trucks, TRU, construction equipment	Tire Wear	Brake Wear	Worker vehicles

Toxic Air Contaminant	HARP TAC ID	Weight Percent							
		Profile 112 Ship Boilers	Profile 114 Ship Aux. Engines [a]	Profile 119 Harbor-craft [a]	Profile 123 Alt. Fuel Engines	Profile 425 Diesel IC Engines [a]	Profile 472 Tire Wear	Profile 473 Brake Wear	Profile 400 Gasoline Autos

Notes:
a. Profiles No. 114, 119, and 425 were only used for the determination of the acute hazard index. For the determination of cancer risk and chronic hazard index, DPM emissions were used without speciation because CARB provides toxicity factors for DPM as a whole (CARB 2013).
b. Hexavalent chromium is assumed to be 5 percent of total chromium, according to CARB's AB2588 Technical Support Document (CARB 1989), page 57.
c. TACs contributing a negligible amount to the total health risk results were screened out of the HRA and are not shown in this table.
d. Source for speciation profiles: CARB 2014.

Table 2-2. Speciation Profiles for TOG

Toxic Air Contaminant	HARP TAC ID	Weight Percent				
		Profile 504 Ship Boilers	Profile 719 Alt. Fuel Engines	Profile 760 Oil Vapors	Profile 818 Diesel IC Engines [a]	Profile 2105 Gasoline Autos
Acetaldehyde	75070	--	0.029	--	7.35	0.28
Acrolein	107028	--	--	--	--	0.13
Benzene	71432	1.91	0.11	--	2.00	2.47
1,3-Butadiene	106990	--	--	--	0.19	0.55
Chlorobenzene	108907	0.044	--	--	--	--
Ethylbenzene	100414	0.062	0.0098	--	0.31	1.05
Formaldehyde	50000	0.088	0.80	--	14.71	0.016
n-Hexane	110543	1.40	0.020	9	0.16	1.60
Methyl Alcohol	67561	--	--	--	0.03	0.12
Methyl Ethyl Ketone	78933	--	--	--	1.48	0.018
Naphthalene	91203	0.062	--	--	0.085	0.047
Propylene	115071	4.02	1.66	--	2.60	3.06
Styrene	100425	--	--	--	0.058	0.12
Toluene	108883	1.90	0.039	--	1.47	5.76
Xylenes	1330207	0.97	0.039	--	1.04	4.80
Applicable sources:		Ship boilers	LNG trucks	Asphalt off-gas	Ship main & aux engines, tugboats, locomotives, CHE, trucks, TRU, construction equipment	Worker vehicles

Toxic Air Contaminant	HARP TAC ID	Weight Percent				
		Profile 504 Ship Boilers	Profile 719 Alt. Fuel Engines	Profile 760 Oil Vapors	Profile 818 Diesel IC Engines [a]	Profile 2105 Gasoline Autos

Notes:
a. Profile No. 818 was only used for the determination of the acute hazard index. For the determination of cancer risk and chronic hazard index, DPM emissions were used without speciation because the ARB provides toxicity factors for DPM as a whole (ARB 2013).
b. TOG - total organic gas, of which VOC is a subset.
c. For Profile No. 504, TOG is 83.47 percent VOC.
d. For Profile No. 719, TOG is 9.14 percent VOC.
e. For Profile No. 760, TOG is 94.8 percent VOC.
f. For Profile No. 818, TOG is 87.85 percent VOC.
g. For Profile No. 2105, TOG is 80.12 percent VOC.
h. TACs contributing a negligible amount to the total health risk results were screened out of the HRA and are not shown in this table.
i. Source for speciation profiles: ARB 2014.

Table 2-3 through Table 2-11 present the 70-year annual average, 40-year annual average, maximum annual, and maximum 1-hour TAC emission rates used in the HRA for the baseline scenarios and project alternatives. Each emission rate represents the summed emissions from all construction and operational sources within the dispersion modeling domain for the indicated averaging period.

Table 2-3. Toxic Air Contaminant Emissions by Source – NOP CEQA Baseline

Toxic Air Contaminant	HARP TAC ID	TAC Emission Rates	
		2012 Annual (lb/yr)	2012 Maximum 1-Hour (lb/hr)
Acetaldehyde	75070	4.00E+00	2.84E+01
Acrolein	107028	7.48E-01	2.19E-04
Ammonia	7664417	1.37E-01	4.28E-01
Arsenic	7440382	1.45E+01	1.16E-01
Benzene	71432	5.51E+01	7.78E+00
1,3-Butadiene	106990	3.08E+00	7.36E-01
Cadmium	7440439	1.34E+00	1.57E-02
Chlorine	7782505	7.05E+00	1.58E-03
Chlorobenzene	108907	7.47E-01	7.93E-04
Copper	7440508	1.25E+01	5.87E-03
Diesel PM (DPM) [a]	9901	2.95E+04	0.00E+00
Ethylbenzene	100414	7.78E+00	1.18E+00
Formaldehyde	50000	6.69E+01	5.69E+01
n-Hexane	110543	3.44E+01	6.36E-01
Hexavalent Chromium	18540299	7.92E-01	5.85E-03
Lead	7439921	1.49E+01	1.23E-01
Manganese	7439965	1.91E+00	5.49E-03
Mercury	7439976	0.00E+00	3.81E-03

Toxic Air Contaminant	HARP TAC ID	TAC Emission Rates	
		2012 Annual (lb/yr)	2012 Maximum 1-Hour (lb/hr)
Methyl Alcohol	67561	6.91E-01	1.16E-01
Methyl Ethyl Ketone	78933	1.03E-01	5.71E+00
Naphthalene	91203	1.31E+00	3.30E-01
Nickel	7440020	2.13E+00	1.33E-02
Propylene	115071	2.22E+02	1.02E+01
Selenium	7782492	1.37E+00	1.19E-02
Styrene	100425	6.94E-01	2.25E-01
Sulfates	9960	7.25E+02	7.63E+00
Toluene	108883	6.79E+01	5.74E+00
Vanadium	7440622	6.98E-01	6.45E-03
Xylenes	1330207	4.68E+01	4.05E+00

Notes:
a. Maximum 1-hour DPM emissions are reported as zero because 1-hour DPM emissions from all sources are speciated into their individual TAC components.
b. This table includes emissions within the dispersion modeling domain.

Table 2-4. Toxic Air Contaminant Emissions by Source – Future CEQA Baseline

Toxic Air Contaminant	HARP TAC ID	TAC Emission Rates	
		70-Year Average (lb/yr)	40-Year Average (lb/yr)
Acetaldehyde	75070	2.77E+00	2.96E+00
Acrolein	107028	2.39E-01	2.72E-01
Ammonia	7664417	1.37E-01	1.37E-01
Arsenic	7440382	1.00E+01	1.01E+01
Benzene	71432	4.50E+01	4.61E+01
1,3-Butadiene	106990	9.84E-01	1.12E+00
Cadmium	7440439	9.25E-01	9.34E-01
Chlorine	7782505	6.75E+00	6.75E+00
Chlorobenzene	108907	7.47E-01	7.47E-01
Copper	7440508	1.25E+01	1.25E+01
Diesel PM (DPM)	9901	1.52E+04	1.58E+04
Ethylbenzene	100414	3.69E+00	3.99E+00
Formaldehyde	50000	6.28E+01	6.59E+01
n-Hexane	110543	2.81E+01	2.86E+01
Hexavalent Chromium	18540299	5.67E-01	5.72E-01
Lead	7439921	1.03E+01	1.04E+01
Manganese	7439965	1.92E+00	1.92E+00
Mercury	7439976	0.00E+00	0.00E+00
Methyl Alcohol	67561	2.21E-01	2.51E-01
Methyl Ethyl Ketone	78933	3.29E-02	3.74E-02
Naphthalene	91203	1.13E+00	1.14E+00
Nickel	7440020	1.72E+00	1.73E+00
Propylene	115071	2.01E+02	2.09E+02

Toxic Air Contaminant	HARP TAC ID	TAC Emission Rates	
		70-Year Average (lb/yr)	40-Year Average (lb/yr)
Selenium	7782492	9.57E-01	9.66E-01
Styrene	100425	2.22E-01	2.52E-01
Sulfates	9960	5.25E+02	5.31E+02
Toluene	108883	4.55E+01	4.71E+01
Vanadium	7440622	6.98E-01	6.98E-01
Xylenes	1330207	2.81E+01	2.95E+01
Notes: a. This table includes emissions within the dispersion modeling domain.			

Table 2-5. Toxic Air Contaminant Emissions by Source – NEPA Baseline and Unmitigated Alternative 2

Toxic Air Contaminant	HARP TAC ID	TAC Emission Rates			
		70-Year Average (lb/yr)	40-Year Average (lb/yr)	Maximum Annual (lb/yr)	Maximum 1-Hour (lb/hr)
Acetaldehyde	75070	3.82E+00	3.92E+00	5.12E+00	3.57E+01
Acrolein	107028	3.53E-01	3.75E-01	6.56E-01	2.02E-04
Ammonia	7664417	1.89E-01	1.86E-01	1.94E-01	3.83E-01
Arsenic	7440382	9.61E+00	9.62E+00	9.99E+00	1.01E-01
Benzene	71432	4.93E+01	4.99E+01	5.86E+01	9.76E+00
1,3-Butadiene	106990	1.46E+00	1.54E+00	2.70E+00	9.22E-01
Cadmium	7440439	8.89E-01	8.90E-01	9.24E-01	1.39E-02
Chlorine	7782505	9.54E+00	9.39E+00	9.77E+00	2.17E-03
Chlorobenzene	108907	7.27E-01	7.28E-01	7.56E-01	1.11E-03
Copper	7440508	1.75E+01	1.72E+01	1.80E+01	6.70E-03
Diesel PM (DPM) [a]	9901	1.80E+04	1.83E+04	2.25E+04	0.00E+00
Ethylbenzene	100414	4.84E+00	5.03E+00	7.50E+00	1.48E+00
Formaldehyde	50000	8.44E+01	8.61E+01	1.02E+02	7.14E+01
n-Hexane	110543	3.00E+01	3.08E+01	5.71E+01	1.55E+00
Hexavalent Chromium	18540299	5.75E-01	5.74E-01	5.96E-01	5.11E-03
Lead	7439921	9.97E+00	9.98E+00	1.04E+01	1.07E-01
Manganese	7439965	2.69E+00	2.65E+00	2.77E+00	5.14E-03
Mercury	7439976	0.00E+00	0.00E+00	0.00E+00	3.41E-03
Methyl Alcohol	67561	3.26E-01	3.46E-01	6.05E-01	1.46E-01
Methyl Ethyl Ketone	78933	4.87E-02	5.17E-02	9.04E-02	7.16E+00
Naphthalene	91203	1.14E+00	1.15E+00	1.29E+00	4.14E-01
Nickel	7440020	2.00E+00	1.98E+00	2.07E+00	1.17E-02
Propylene	115071	2.48E+02	2.52E+02	2.95E+02	1.27E+01
Selenium	7782492	9.34E-01	9.34E-01	9.70E-01	1.05E-02
Styrene	100425	3.28E-01	3.48E-01	6.08E-01	2.81E-01
Sulfates	9960	5.32E+02	5.32E+02	5.55E+02	6.75E+00
Toluene	108883	5.07E+01	5.18E+01	6.60E+01	7.20E+00

Toxic Air Contaminant	HARP TAC ID	TAC Emission Rates			
		70-Year Average (lb/yr)	40-Year Average (lb/yr)	Maximum Annual (lb/yr)	Maximum 1-Hour (lb/hr)
Vanadium	7440622	9.77E-01	9.62E-01	1.00E+00	7.00E-03
Xylenes	1330207	3.29E+01	3.38E+01	4.54E+01	5.08E+00

Notes:
a. Maximum 1-hour DPM emissions are reported as zero because 1-hour DPM emissions from all sources are speciated into their individual TAC components.
b. This table includes emissions within the dispersion modeling domain.

Table 2-6. Toxic Air Contaminant Emissions by Source – Proposed Project, Unmitigated

Toxic Air Contaminant	HARP TAC ID	TAC Emission Rates			
		70-Year Average (lb/yr)	40-Year Average (lb/yr)	Maximum Annual (lb/yr)	Maximum 1-Hour (lb/hr)
Acetaldehyde	75070	4.20E+00	4.30E+00	5.55E+00	3.69E+01
Acrolein	107028	3.90E-01	4.10E-01	6.55E-01	2.01E-04
Ammonia	7664417	2.09E-01	2.05E-01	2.15E-01	3.96E-01
Arsenic	7440382	1.02E+01	1.02E+01	1.02E+01	1.21E-01
Benzene	71432	5.30E+01	5.35E+01	6.09E+01	1.01E+01
1,3-Butadiene	106990	1.61E+00	1.69E+00	2.70E+00	9.55E-01
Cadmium	7440439	9.43E-01	9.41E-01	9.46E-01	1.58E-02
Chlorine	7782505	1.06E+01	1.03E+01	1.08E+01	2.41E-03
Chlorobenzene	108907	7.72E-01	7.70E-01	7.74E-01	1.15E-03
Copper	7440508	1.93E+01	1.90E+01	1.99E+01	7.23E-03
Diesel PM (DPM) [a]	9901	1.94E+04	1.97E+04	2.58E+04	0.00E+00
Ethylbenzene	100414	5.30E+00	5.47E+00	7.66E+00	1.53E+00
Formaldehyde	50000	9.28E+01	9.44E+01	1.14E+02	7.39E+01
n-Hexane	110543	3.21E+01	3.28E+01	5.98E+01	8.43E-01
Hexavalent Chromium	18540299	6.14E-01	6.11E-01	6.19E-01	6.10E-03
Lead	7439921	1.06E+01	1.06E+01	1.06E+01	1.27E-01
Manganese	7439965	2.97E+00	2.92E+00	3.07E+00	5.37E-03
Mercury	7439976	0.00E+00	0.00E+00	0.00E+00	3.53E-03
Methyl Alcohol	67561	3.60E-01	3.78E-01	6.05E-01	1.51E-01
Methyl Ethyl Ketone	78933	5.38E-02	5.65E-02	9.04E-02	7.42E+00
Naphthalene	91203	1.22E+00	1.22E+00	1.32E+00	4.28E-01
Nickel	7440020	2.17E+00	2.15E+00	2.22E+00	1.36E-02
Propylene	115071	2.70E+02	2.73E+02	3.21E+02	1.32E+01
Selenium	7782492	9.93E-01	9.90E-01	9.97E-01	1.23E-02
Styrene	100425	3.62E-01	3.80E-01	6.08E-01	2.91E-01
Sulfates	9960	5.68E+02	5.67E+02	5.76E+02	7.73E+00
Toluene	108883	5.46E+01	5.55E+01	6.73E+01	7.45E+00
Vanadium	7440622	1.08E+00	1.06E+00	1.11E+00	7.14E-03

Toxic Air Contaminant	HARP TAC ID	TAC Emission Rates			
		70-Year Average (lb/yr)	40-Year Average (lb/yr)	Maximum Annual (lb/yr)	Maximum 1-Hour (lb/hr)
Xylenes	1330207	3.56E+01	3.64E+01	4.63E+01	5.26E+00

Notes:
a. Maximum 1-hour DPM emissions are reported as zero because 1-hour DPM emissions from all sources are speciated into their individual TAC components.
b. This table includes emissions within the dispersion modeling domain.

Table 2-7. Toxic Air Contaminant Emissions by Source – Proposed Project, Mitigated

Toxic Air Contaminant	HARP TAC ID	TAC Emission Rates			
		70-Year Average (lb/yr)	40-Year Average (lb/yr)	Maximum Annual (lb/yr)	Maximum 1-Hour (lb/hr)
Acetaldehyde	75070	4.20E+00	4.30E+00	5.55E+00	3.62E+01
Acrolein	107028	3.90E-01	4.10E-01	6.55E-01	2.01E-04
Ammonia	7664417	2.09E-01	2.05E-01	2.15E-01	3.67E-01
Arsenic	7440382	1.02E+01	1.02E+01	1.02E+01	1.21E-01
Benzene	71432	5.30E+01	5.35E+01	6.09E+01	9.90E+00
1,3-Butadiene	106990	1.61E+00	1.69E+00	2.70E+00	9.35E-01
Cadmium	7440439	9.43E-01	9.41E-01	9.46E-01	1.55E-02
Chlorine	7782505	1.06E+01	1.03E+01	1.08E+01	2.41E-03
Chlorobenzene	108907	7.72E-01	7.70E-01	7.74E-01	1.15E-03
Copper	7440508	1.93E+01	1.90E+01	1.99E+01	7.01E-03
Diesel PM (DPM) [a]	9901	1.82E+04	1.86E+04	2.34E+04	0.00E+00
Ethylbenzene	100414	5.30E+00	5.47E+00	7.66E+00	1.50E+00
Formaldehyde	50000	9.28E+01	9.44E+01	1.14E+02	7.24E+01
n-Hexane	110543	3.21E+01	3.28E+01	5.98E+01	1.74E+00
Hexavalent Chromium	18540299	6.14E-01	6.11E-01	6.19E-01	6.10E-03
Lead	7439921	1.06E+01	1.06E+01	1.06E+01	1.27E-01
Manganese	7439965	2.97E+00	2.92E+00	3.07E+00	5.01E-03
Mercury	7439976	0.00E+00	0.00E+00	0.00E+00	3.26E-03
Methyl Alcohol	67561	3.60E-01	3.78E-01	6.05E-01	1.48E-01
Methyl Ethyl Ketone	78933	5.38E-02	5.65E-02	9.04E-02	7.26E+00
Naphthalene	91203	1.22E+00	1.22E+00	1.32E+00	4.20E-01
Nickel	7440020	2.17E+00	2.15E+00	2.22E+00	1.35E-02
Propylene	115071	2.70E+02	2.73E+02	3.21E+02	1.29E+01
Selenium	7782492	9.93E-01	9.90E-01	9.97E-01	1.22E-02
Styrene	100425	3.62E-01	3.80E-01	6.08E-01	2.85E-01
Sulfates	9960	5.68E+02	5.67E+02	5.76E+02	7.58E+00
Toluene	108883	5.46E+01	5.55E+01	6.73E+01	7.30E+00
Vanadium	7440622	1.08E+00	1.06E+00	1.11E+00	6.88E-03
Xylenes	1330207	3.56E+01	3.64E+01	4.63E+01	5.15E+00

Toxic Air Contaminant	HARP TAC ID	TAC Emission Rates			
		70-Year Average (lb/yr)	40-Year Average (lb/yr)	Maximum Annual (lb/yr)	Maximum 1-Hour (lb/hr)

Notes:
a. Maximum 1-hour DPM emissions are reported as zero because 1-hour DPM emissions from all sources are speciated into their individual TAC components.
b. This table includes emissions within the dispersion modeling domain.

Table 2-8. Toxic Air Contaminant Emissions by Source – Alternative 1, Unmitigated

Toxic Air Contaminant	HARP TAC ID	TAC Emission Rates			
		70-Year Average (lb/yr)	40-Year Average (lb/yr)	Maximum Annual (lb/yr)	Maximum 1-Hour (lb/hr)
Acetaldehyde	75070	3.82E+00	3.92E+00	5.12E+00	3.55E+01
Acrolein	107028	3.53E-01	3.75E-01	6.56E-01	2.02E-04
Ammonia	7664417	1.89E-01	1.86E-01	1.94E-01	3.81E-01
Arsenic	7440382	9.61E+00	9.62E+00	9.99E+00	1.01E-01
Benzene	71432	4.93E+01	4.99E+01	5.86E+01	9.72E+00
1,3-Butadiene	106990	1.46E+00	1.54E+00	2.70E+00	9.18E-01
Cadmium	7440439	8.89E-01	8.90E-01	9.24E-01	1.38E-02
Chlorine	7782505	9.54E+00	9.39E+00	9.77E+00	2.17E-03
Chlorobenzene	108907	7.27E-01	7.28E-01	7.56E-01	1.11E-03
Copper	7440508	1.75E+01	1.72E+01	1.80E+01	6.68E-03
Diesel PM (DPM) [a]	9901	1.80E+04	1.83E+04	2.24E+04	0.00E+00
Ethylbenzene	100414	4.84E+00	5.03E+00	7.50E+00	1.48E+00
Formaldehyde	50000	8.44E+01	8.61E+01	1.02E+02	7.11E+01
n-Hexane	110543	2.94E+01	2.98E+01	3.44E+01	7.96E-01
Hexavalent Chromium	18540299	5.75E-01	5.74E-01	5.96E-01	5.11E-03
Lead	7439921	9.97E+00	9.98E+00	1.04E+01	1.07E-01
Manganese	7439965	2.69E+00	2.65E+00	2.77E+00	5.12E-03
Mercury	7439976	0.00E+00	0.00E+00	0.00E+00	3.39E-03
Methyl Alcohol	67561	3.26E-01	3.46E-01	6.05E-01	1.45E-01
Methyl Ethyl Ketone	78933	4.87E-02	5.17E-02	9.04E-02	7.13E+00
Naphthalene	91203	1.14E+00	1.15E+00	1.29E+00	4.12E-01
Nickel	7440020	2.00E+00	1.98E+00	2.07E+00	1.17E-02
Propylene	115071	2.48E+02	2.52E+02	2.95E+02	1.27E+01
Selenium	7782492	9.34E-01	9.34E-01	9.70E-01	1.04E-02
Styrene	100425	3.28E-01	3.48E-01	6.08E-01	2.80E-01
Sulfates	9960	5.32E+02	5.32E+02	5.55E+02	6.74E+00
Toluene	108883	5.07E+01	5.18E+01	6.60E+01	7.17E+00
Vanadium	7440622	9.77E-01	9.62E-01	1.00E+00	6.98E-03
Xylenes	1330207	3.29E+01	3.38E+01	4.54E+01	5.06E+00

Notes:
a. Maximum 1-hour DPM emissions are reported as zero because 1-hour DPM emissions from all sources are

Toxic Air Contaminant	HARP TAC ID	TAC Emission Rates			
		70-Year Average (lb/yr)	40-Year Average (lb/yr)	Maximum Annual (lb/yr)	Maximum 1-Hour (lb/hr)
speciated into their individual TAC components. b. This table includes emissions within the dispersion modeling domain.					

Table 2-9. Toxic Air Contaminant Emissions by Source – Alternative 2, Mitigated

Toxic Air Contaminant	HARP TAC ID	TAC Emission Rates			
		70-Year Average (lb/yr)	40-Year Average (lb/yr)	Maximum Annual (lb/yr)	Maximum 1-Hour (lb/hr)
Acetaldehyde	75070	3.82E+00	3.92E+00	5.12E+00	3.52E+01
Acrolein	107028	3.53E-01	3.75E-01	6.56E-01	2.02E-04
Ammonia	7664417	1.89E-01	1.86E-01	1.94E-01	3.62E-01
Arsenic	7440382	9.61E+00	9.62E+00	9.99E+00	1.01E-01
Benzene	71432	4.93E+01	4.99E+01	5.86E+01	9.62E+00
1,3-Butadiene	106990	1.46E+00	1.54E+00	2.70E+00	9.09E-01
Cadmium	7440439	8.89E-01	8.90E-01	9.24E-01	1.36E-02
Chlorine	7782505	9.54E+00	9.39E+00	9.77E+00	2.17E-03
Chlorobenzene	108907	7.27E-01	7.28E-01	7.56E-01	1.11E-03
Copper	7440508	1.75E+01	1.72E+01	1.80E+01	6.54E-03
Diesel PM (DPM) [a]	9901	1.70E+04	1.74E+04	2.19E+04	0.00E+00
Ethylbenzene	100414	4.84E+00	5.03E+00	7.50E+00	1.46E+00
Formaldehyde	50000	8.44E+01	8.61E+01	1.02E+02	7.04E+01
n-Hexane	110543	3.00E+01	3.08E+01	5.71E+01	1.54E+00
Hexavalent Chromium	18540299	5.75E-01	5.74E-01	5.96E-01	5.11E-03
Lead	7439921	9.97E+00	9.98E+00	1.04E+01	1.07E-01
Manganese	7439965	2.69E+00	2.65E+00	2.77E+00	4.89E-03
Mercury	7439976	0.00E+00	0.00E+00	0.00E+00	3.22E-03
Methyl Alcohol	67561	3.26E-01	3.46E-01	6.05E-01	1.44E-01
Methyl Ethyl Ketone	78933	4.87E-02	5.17E-02	9.04E-02	7.06E+00
Naphthalene	91203	1.14E+00	1.15E+00	1.29E+00	4.08E-01
Nickel	7440020	2.00E+00	1.98E+00	2.07E+00	1.16E-02
Propylene	115071	2.48E+02	2.52E+02	2.95E+02	1.26E+01
Selenium	7782492	9.34E-01	9.34E-01	9.70E-01	1.04E-02
Styrene	100425	3.28E-01	3.48E-01	6.08E-01	2.78E-01
Sulfates	9960	5.32E+02	5.32E+02	5.55E+02	6.64E+00
Toluene	108883	5.07E+01	5.18E+01	6.60E+01	7.10E+00
Vanadium	7440622	9.77E-01	9.62E-01	1.00E+00	6.82E-03
Xylenes	1330207	3.29E+01	3.38E+01	4.54E+01	5.01E+00
Notes: a. Maximum 1-hour DPM emissions are reported as zero because 1-hour DPM emissions from all sources are speciated into their individual TAC components.					

Toxic Air Contaminant	HARP TAC ID	TAC Emission Rates			
		70-Year Average (lb/yr)	40-Year Average (lb/yr)	Maximum Annual (lb/yr)	Maximum 1-Hour (lb/hr)
b. This table includes emissions within the dispersion modeling domain.					

Table 2-10. Toxic Air Contaminant Emissions by Source – Alternative 3, Unmitigated

Toxic Air Contaminant	HARP TAC ID	TAC Emission Rates			
		70-Year Average (lb/yr)	40-Year Average (lb/yr)	Maximum Annual (lb/yr)	Maximum 1-Hour (lb/hr)
Acetaldehyde	75070	4.20E+00	4.30E+00	5.55E+00	4.78E+01
Acrolein	107028	3.90E-01	4.10E-01	6.55E-01	2.01E-04
Ammonia	7664417	2.09E-01	2.05E-01	2.15E-01	5.10E-01
Arsenic	7440382	1.15E+01	1.14E+01	1.16E+01	1.36E-01
Benzene	71432	5.71E+01	5.74E+01	6.53E+01	1.31E+01
1,3-Butadiene	106990	1.61E+00	1.69E+00	2.70E+00	1.24E+00
Cadmium	7440439	1.06E+00	1.05E+00	1.07E+00	1.86E-02
Chlorine	7782505	1.06E+01	1.03E+01	1.08E+01	2.41E-03
Chlorobenzene	108907	8.67E-01	8.61E-01	8.75E-01	1.46E-03
Copper	7440508	1.93E+01	1.90E+01	1.99E+01	8.07E-03
Diesel PM (DPM) [a]	9901	2.11E+04	2.13E+04	2.70E+04	0.00E+00
Ethylbenzene	100414	5.43E+00	5.59E+00	7.80E+00	1.99E+00
Formaldehyde	50000	9.30E+01	9.46E+01	1.14E+02	9.57E+01
n-Hexane	110543	3.51E+01	3.57E+01	6.31E+01	1.20E+00
Hexavalent Chromium	18540299	6.77E-01	6.71E-01	6.86E-01	6.86E-03
Lead	7439921	1.19E+01	1.18E+01	1.20E+01	1.44E-01
Manganese	7439965	2.97E+00	2.92E+00	3.07E+00	6.71E-03
Mercury	7439976	0.00E+00	0.00E+00	0.00E+00	4.54E-03
Methyl Alcohol	67561	3.60E-01	3.78E-01	6.05E-01	1.95E-01
Methyl Ethyl Ketone	78933	5.38E-02	5.65E-02	9.04E-02	9.61E+00
Naphthalene	91203	1.35E+00	1.35E+00	1.46E+00	5.55E-01
Nickel	7440020	2.29E+00	2.26E+00	2.34E+00	1.56E-02
Propylene	115071	2.78E+02	2.82E+02	3.30E+02	1.71E+01
Selenium	7782492	1.11E+00	1.10E+00	1.12E+00	1.40E-02
Styrene	100425	3.62E-01	3.80E-01	6.08E-01	3.77E-01
Sulfates	9960	6.26E+02	6.22E+02	6.38E+02	9.00E+00
Toluene	108883	5.87E+01	5.94E+01	7.17E+01	9.66E+00
Vanadium	7440622	1.08E+00	1.06E+00	1.11E+00	8.12E-03
Xylenes	1330207	3.77E+01	3.84E+01	4.86E+01	6.81E+00

Notes:
a. Maximum 1-hour DPM emissions are reported as zero because 1-hour DPM emissions from all sources are speciated into their individual TAC components.
b. This table includes emissions within the dispersion modeling domain.

Table 2-11. Toxic Air Contaminant Emissions by Source – Alternative 3, Mitigated

Toxic Air Contaminant	HARP TAC ID	TAC Emission Rates			
		70-Year Average (lb/yr)	40-Year Average (lb/yr)	Maximum Annual (lb/yr)	Maximum 1-Hour (lb/hr)
Acetaldehyde	75070	4.20E+00	4.30E+00	5.55E+00	4.67E+01
Acrolein	107028	3.90E-01	4.10E-01	6.55E-01	2.01E-04
Ammonia	7664417	2.09E-01	2.05E-01	2.15E-01	4.63E-01
Arsenic	7440382	1.15E+01	1.14E+01	1.16E+01	1.36E-01
Benzene	71432	5.71E+01	5.74E+01	6.53E+01	1.28E+01
1,3-Butadiene	106990	1.61E+00	1.69E+00	2.70E+00	1.21E+00
Cadmium	7440439	1.06E+00	1.05E+00	1.07E+00	1.80E-02
Chlorine	7782505	1.06E+01	1.03E+01	1.08E+01	2.41E-03
Chlorobenzene	108907	8.67E-01	8.61E-01	8.75E-01	1.46E-03
Copper	7440508	1.93E+01	1.90E+01	1.99E+01	7.72E-03
Diesel PM (DPM) [a]	9901	1.99E+04	2.02E+04	2.50E+04	0.00E+00
Ethylbenzene	100414	5.43E+00	5.59E+00	7.80E+00	1.94E+00
Formaldehyde	50000	9.30E+01	9.46E+01	1.14E+02	9.35E+01
n-Hexane	110543	3.51E+01	3.57E+01	6.31E+01	1.98E+00
Hexavalent Chromium	18540299	6.77E-01	6.71E-01	6.86E-01	6.85E-03
Lead	7439921	1.19E+01	1.18E+01	1.20E+01	1.43E-01
Manganese	7439965	2.97E+00	2.92E+00	3.07E+00	6.16E-03
Mercury	7439976	0.00E+00	0.00E+00	0.00E+00	4.12E-03
Methyl Alcohol	67561	3.60E-01	3.78E-01	6.05E-01	1.91E-01
Methyl Ethyl Ketone	78933	5.38E-02	5.65E-02	9.04E-02	9.38E+00
Naphthalene	91203	1.35E+00	1.35E+00	1.46E+00	5.42E-01
Nickel	7440020	2.29E+00	2.26E+00	2.34E+00	1.54E-02
Propylene	115071	2.78E+02	2.82E+02	3.30E+02	1.67E+01
Selenium	7782492	1.11E+00	1.10E+00	1.12E+00	1.39E-02
Styrene	100425	3.62E-01	3.80E-01	6.08E-01	3.69E-01
Sulfates	9960	6.26E+02	6.22E+02	6.38E+02	8.76E+00
Toluene	108883	5.87E+01	5.94E+01	7.17E+01	9.43E+00
Vanadium	7440622	1.08E+00	1.06E+00	1.11E+00	7.71E-03
Xylenes	1330207	3.77E+01	3.84E+01	4.86E+01	6.66E+00

Notes:
a. Maximum 1-hour DPM emissions are reported as zero because 1-hour DPM emissions from all sources are speciated into their individual TAC components.
b. This table includes emissions within the dispersion modeling domain.

3.0 Receptor Locations

This HRA analyzes the health effects associated with TAC emissions from project and alternative-related sources at a variety of locations (receptors) throughout the project area, including at the locations of potential exposure of residents, offsite workers, recreational users, students, and sensitive member of the public. The analysis utilized a coarse grid of 1,412 receptor points. The coarse grid consisted of an inner grid, with receptors positioned every 250 meters and covering an area of 5 km x 6.5 km, surrounded by an outer grid, with receptors positioned every 500 meters and covering an area of 11 km x 11.5 km. Multiple fine grids, with receptors positioned every 50 meters, were placed over the maximum coarse grid receptors to obtain HRA results to the nearest 50 meters. Figure 3-1 presents the coarse and fine receptor grids used in the HRA.

In addition, TAC concentrations were modeled at 212 discrete sensitive receptor locations of special concern, such as schools, child care centers, convalescent homes, and hospitals in the vicinity of the terminal site. Figure 3-2 shows the locations of the sensitive receptors included in the analysis, and Table 3-1 presents a list of all sensitive receptors cross-referenced by the number used to identify their location in Figure 3-2.

Table 3-1. Sensitive Receptors

Receptor No.	UTM X (m)	UTM Y (m)	Receptor Description	Street Address	City, State, Zip	Category
1	380863	3732991	15th Street Elementary School	1527 Mesa St	San Pedro, CA 90731	School
2	378541	3733938	7th Street Elementary School	1570 W. 7th St	San Pedro, CA 90731	School
3	390978	3738503	Abraham Lincoln Elementary School	1175 E 11th St	Long Beach, CA 90813	School
4	379271	3732975	Academy of the Two Hearts School	1540 S. Walker Ave	San Pedro, CA 90731	School
5	380162	3730867	Angel's Gate Hight School	3607 S. Gaffey St	San Pedro, CA 90731	School
6	389448	3738624	Artesia Well Preparatory Academy	1235 Pacific Ave	Long Beach, CA 90813	School
7	383095	3739869	Avalon High School	1425 N Avalon Blvd	Wilmington, CA 90744	School
8	379660	3734797	Bandini Street Elementary School	425 N. Bandini St	San Pedro, CA 90731	School
9	382813	3738058	Banning New Elementary School #1	500 North Island Ave.	Wilmington, CA 90744	School
10	380681	3734795	Barton Hill Elementary School	423 N. Pacific Ave	San Pedro, CA 90731	School
11	388765	3741760	Birney Elementary School	710 W. Spring St	Long Beach, CA 90806	School
12	385308	3746652	Broadacres Elementary School	19424 South Broadacres Ave	Carson, CA 90746	School
13	392109	3737595	Burbank Elementary	501 Junipero Ave	Long Beach, CA 90814	School

Receptor No.	UTM X (m)	UTM Y (m)	Receptor Description	Street Address	City, State, Zip	Category
14	390224	3740330	Burnett Elementary	565 East Hill St.	Long Beach, CA 90806	School
15	380154	3733793	Cabrillo Avenue Elementary School	732 S. Cabrillo Ave	San Pedro, CA 90731	School
16	389538	3740963	Cambodian Christian	2474 Pacific Ave	Long Beach, CA 90806	School
17	388742	3737045	Cesar Chavez Elementary	730 West Third St.	Long Beach, CA 90802	School
18	378649	3736024	Christ Lutheran Elementary School	28850 S. Western Ave	Rancho Palos Verdes, CA 90275	School
19	392096	3737727	City Christian School	2209 E 6th St	Long Beach, CA 90814	School
20	388630	3747767	Colin L Powell Academy for Success	150 Victoria St	Long Beach, CA 90805	School
21	391439	3738927	Creative Arts Daycare and Elementary School	1423 Walnut Ave	Long Beach, CA 90813	School
22	378441	3735152	Crestwood Street Elementary School	1946 W. Crestwood St	Rancho Palos Verdes, CA 90275	School
23	387444	3742469	Daniel Webster Elementary School	1755 W 32nd Way	Long Beach, CA 90810	School
24	385244	3744652	Del Amo Elementary School	21228 Water St	Carson, CA 90745	School
25	387564	3744579	Dominguez Elementary School	21250 Santa Fe Ave	Carson, CA 90810	School
26	388749	3737794	Edison Elementary	625 Maine Ave.	Long Beach, CA 90802	School
27	386969	3740593	Elizabeth Hudson Elementary School	2335 Webster Ave	Long Beach, CA 90810	School
28	378377	3739433	Eshelman Avenue School	25902 Eshelman Ave	Lomita, CA 90717	School
29	383262	3739680	First Baptist Christian School	1360 Broad Ave	Wilmington, CA 90744	School
30	389624	3738317	First Baptist Church School	1000 Pine Ave	Long Beach, CA 90813	School
31	390180	3738228	First Lutheran Day Care, Preschool and Elementary School	946 Linden Ave	Long Beach, CA 90813	School
32	378510	3739856	Fleming Middle School	242 Walnut St	Lomita, CA 90717	School
33	390951	3737680	Franklin Classical Middle	540 Cerritos Ave.	Long Beach, CA 90802	School
34	382778	3739398	Fries Ave. Elementary School	1301 N Fries Ave	Wilmington, CA 90744	School
35	389389	3738887	George Washington Middle School	1450 Cedar Ave	Long Beach, CA 90813	School
36	382180	3739100	Gulf Avenue Elementary School	828 W. L St	Wilmington, CA 90744	School
37	379361	3740015	Harbor City Elementary	1508 254th St	Harbor City, CA	School

Receptor No.	UTM X (m)	UTM Y (m)	Receptor Description	Street Address	City, State, Zip	Category
			School		90710	
38	380678	3735343	Harbor Occupational Center	740 N. Pacific Ave.	San Pedro, CA 90731	School
39	381835	3737984	Hawaiian Avenue Elementary School	540 Hawaiian Ave	Wilmington, CA 90744	School
40	384377	3739369	Holy Family Preschool and Elementary School	1122 E Robidoux St	Wilmington, CA 90744	School
41	389535	3741054	Holy Innocents Elementary School	2500 Pacific Ave	Long Beach, CA 90806	School
42	379332	3734589	Holy Trinity Elementary School	1226 W. Santa Cruz St	San Pedro, CA 90732	School
43	379760	3736916	J F Cooper High School	2210 N. Taper Ave	San Pedro, CA 90731	School
44	389686	3741436	Jackie Robinson Academy	2750 Pine Ave	Long Beach, CA 90806	School
45	387724	3740376	James Garfield Elementary School	2240 Baltic Ave	Long Beach, CA 90810	School
46	391464	3739299	John G Whittier Elementary School	1761 Walnut Ave	Long Beach, CA 90813	School
47	387943	3742041	John Muir Elementary School	3038 Delta Ave	Long Beach, CA 90810	School
48	387255	3739936	Juan Rodriguez Cabrillo High School	2001 Santa Fe Ave	Long Beach, CA 90810	School
49	389235	3740749	Lafayette Elementary School	2445 Chestnut Ave	Long Beach, CA 90806	School
50	379517	3732375	Leland Street Elementary School	2120 S. Leland St	San Pedro, CA 90731	School
51	390207	3737910	Long Beach Montessori School	525 E. 7th St	Long Beach, CA 90813	School
52	379407	3739022	Lorenz Hillside School	1516 Anaheim St	Harbor City, CA 90710	School
53	386753	3739676	Mary Bethune School	2101 San Gabriel Ave	Long Beach, CA 90810	School
54	391293	3739859	Mary Butler Elementary	1400 E 20th St	Long Beach, CA 90806	School
55	380014	3733758	Mary Star of the Sea Elementary School	717 S. Cabrillo Ave	San Pedro, CA 90731	School
56	379954	3733809	Mary Star of the Sea High School	810 W. 8th St	San Pedro, CA 90731	School
57	376898	3735657	Miraleste Intermediate School	29323 Palos Verdes Dr. E	Rancho Palos Verdes, CA 90275	School
58	377333	3735407	Miraleste Satellite Elementary School	6245 Via Canada	Rancho Palos Verdes, CA 90275	School
59	380299	3740161	Normont Elementary School	1001 253rd St	Harbor City, CA 90710	School
60	389875	3741853	Oakwood Academy	2951 Long Beach Blvd	Long Beach, CA 90806	School
61	381988	3739995	Pacific Harbor Christian	1530 N.	Wilmington, CA	School

Receptor No.	UTM X (m)	UTM Y (m)	Receptor Description	Street Address	City, State, Zip	Category
			School	Wilmington Blvd	90744	
62	379279	3735517	Park Western Place Elementary School	1214 Park Western Place	San Pedro, CA 90732	School
63	383012	3739783	Phineas Banning Senior High School	1527 Lakme Ave	Wilmington, CA 90744	School
64	390353	3739073	Polytechnic High School	1600Atlantic Ave.	Long Beach, CA 90813	School
65	380461	3731193	Pt. Fermin Elementary School	3333 Kerckhoff Ave	San Pedro, CA 90731	School
66	380049	3733031	R H Dana Middle School	1501 S. Cabrillo	San Pedro, CA 90731	School
67	378187	3736987	R S Dodson Middle School	28014 Montereine Dr	San Pedro, CA 90731	School
68	389106	3738800	Regency High School	490 W. 14th Street	Long Beach, CA 90813	School
69	389796	3738044	Renaissance High School for the Arts	235 East Eighth St.	Long Beach, CA 90813	School
70	379594	3738367	Rolling Hills Preparatory School	1 Rolling Hills Prep Way	San Pedro, CA 90732	School
71	390160	3739058	Roosevelt Elementary	1574 Linden Ave.	Long Beach, CA 90813	School
72	390631	3737633	Saint Anthony Preschool / Elementary	855 East Fifth St.	Long Beach, CA 90802	School
73	382425	3738317	Saints Peter & Paul School	706 Bay View Ave	Wilmington, CA 90744	School
74	379699	3732970	San Pedro High School	1001 W. 15th St	San Pedro, CA 90731	School
75	387156	3740295	Savannah Academy	2152 W Hill St	Long Beach, CA 90810	School
76	390368	3747404	Select Community Day (Secondary)	5869 Atlantic Ave.	Long Beach, CA 90802	School
77	391437	3740427	Signal Hill Elementary School	2285 Walnut Ave	Long Beach, CA 90806	School
78	390538	3737763	St. Anthony High School/Constellation Community Charter Middle	620 Olive Ave.	Long Beach, CA 90802	School
79	387420	3740551	St. Lucy School	2320 Cota Ave	Long Beach, CA 90810	School
80	390299	3737645	Stevenson Elementary	515 Lime Ave.	Long Beach, CA 90802	School
81	388905	3745866	Sutter Elementary School	5075 Daisy Ave	Long Beach, CA 90805	School
82	379821	3736524	Taper Avenue Elementary School	1824 N. Taper Ave	San Pedro, CA 90731	School
83	389624	3738615	The New City School	1230 Pine Ave	Long Beach, CA 90813	School
84	378750	3733896	Trinity Luthern School	1450 W. 7th St	San Pedro, CA 90731	School
85	381627	3738566	Vermont Christian School	931 Frigate Ave	Wilmington, CA 90744	School

Receptor No.	UTM X (m)	UTM Y (m)	Receptor Description	Street Address	City, State, Zip	Category
86	378837	3731468	White Point Elementary School	1410 Silvius Ave	San Pedro, CA 90731	School
87	378709	3734317	Willenberg Special Education	308 S. Weymouth Ave.	San Pedro, CA 90731	School
88	387129	3741587	William Logan Stephens Middle School	1830 W Columbia St	Long Beach, CA 90810	School
89	382074	3740337	Wilmington Middle School	1700 Gulf Ave	Wilmington, CA 90744	School
90	384631	3739119	Wilmington Park Elementary School	1140 Mahar Ave	Wilmington, CA 90744	School
91	389921	3738609	12TH STREET HEAD START	1212 LONG BEACH BLVD	Long Beach, CA 90806	Child Care
92	390052	3737368	A LOVE 4 LEARNING ACADEMY	306 ELM AVENUE	Long Beach, CA 90802	Child Care
93	378996	3739241	Armstrong Academy	1682 Anaheim St	Harbor City, CA 90710	Child Care
94	390315	3739619	Atlantic Headstart	1862 Atlantic Ave	Long Beach, CA 90806	Child Care
95	392120	3737740	BETHANY PRESCHOOL	2217 EAST 6TH ST.	Long Beach, CA 90814	Child Care
96	384531	3743755	Blessing's Child Care	1422 E Bach St	Carson, CA 90745	Child Care
97	378469	3734936	Brighter Days Montessori	1903 W. Summerland St	San Pedro, CA 90732	Child Care
98	391267	3739145	Bundle of Joy Daycare 2	1330 E 16th St	Long Beach, CA 90813	Child Care
99	386795	3740292	CABRILLO CHILD DEVELOPMENT CENTER	2205 SAN GABRIEL AVE.	Long Beach, CA 90810	Child Care
100	380186	3733726	Cabrillo Early Education Center	741 W. 8th St	San Pedro, CA 90731	Child Care
101	381264	3732980	Carmen's Cry Baby Care	1509 S. Palos Verdes St	San Pedro, CA 90731	Child Care
102	391870	3737404	Carousel Preschool	366 Cherry Ave	Long Beach, CA 90802	Child Care
103	390062	3738250	Child Care Center At St Mary Medical Center	930 Elm Ave	Long Beach, CA 90813	Child Care
104	389026	3737038	Childtime Learning Center	1 World Trade Ctr # 199	Long Beach, CA 90813	Child Care
105	389481	3741039	Comprehensive Child Development	2565 Pacific Ave.	Long Beach, CA 90806	Child Care
106	380158	3734275	Compreshensive Child Development	769 W. 3rd St	San Pedro, CA 90731	Child Care
107	379694	3736911	Cooper Community Day School	2210 Taper Ave	San Pedro, CA 90731	Child Care
108	393175	3738811	CORONADO HEAD START CHILD CARE CENTER	1395 CORONADO STREET	Long Beach, CA 90804	Child Care
109	378816	3733895	Dahlquist Preschool	1420 W. 7th St	San Pedro, CA 90731	Child Care
110	380440	3733911	Day Star Early Learning	631 W. 6th St	San Pedro, CA	Child Care

Receptor No.	UTM X (m)	UTM Y (m)	Receptor Description	Street Address	City, State, Zip	Category
			Center		90731	
111	389981	3738882	ELM STREET HEAD START	1425 & 1429 ELM AVENUE	Long Beach, CA 90806	Child Care
112	387241	3744204	First Baptist Preschool and Daycare	2679 E Carson St	Long Beach, CA 90810	Child Care
113	392325	3738423	First Foursquare Church Preschool	2416 E 11th St	Long Beach, CA 90804	Child Care
114	388635	3741379	Fords Family Day Care	2726 San Francisco Ave	Long Beach, CA 90806	Child Care
115	387670	3740411	GARFIELD HEAD START	2240 BALTIC AVENUE	Long Beach, CA 90810	Child Care
116	391565	3738529	GAVIOTA HEAD START	1131 GAVIOTA STREET	Long Beach, CA 90813	Child Care
117	378851	3732160	Good Shepherd Preschool	1350 W. 25th St	San Pedro, CA 90732	Child Care
118	392941	3737474	Great Beginnings	3027 E. 4th St.	Long Beach, CA 90814	Child Care
119	381827	3738004	Hawaiian Avenue Children's Center	909 W. D St	Wilmington, CA 90744	Child Care
120	392873	3738988	Huntington Academy - Preschool	2935 E. Spaulding St.	Long Beach, CA 90804	Child Care
121	391036	3739334	Jenkins Day Care	1720 Cerritos Ave	Long Beach, CA 90813	Child Care
122	387506	3739696	JOB CORP HEAD START	1903 SANTA FE AVE.	Long Beach, CA 90810	Child Care
123	390594	3738247	Kelly's Care	943 N Washington Pl	Long Beach, CA 90813	Child Care
124	388725	3741155	Kelly's Kids Daycare Center	855 W Willow St	Long Beach, CA 90806	Child Care
125	379320	3739551	Learning Garden Preschool	1518 Pacific Coast Hwy	Harbor City, CA 90710	Child Care
126	387305	3743542	Little Greenwood Daycare	22114 S Carlerik Ave	Long Beach, CA 90810	Child Care
127	389578	3738196	LITTLE LIGHTHOUSE EDUCATIONAL CHILDCARE CENTER	911 PINE AVENUE	Long Beach, CA 90813	Child Care
128	389940	3740373	LONG BEACH BLVD HEAD START	2236 LONG BEACH BLVD.	Long Beach, CA 90806	Child Care
129	390373	3740260	LONG BEACH CENTER FOR CHILD DEVELOPMENT	622 E. HILL STREET	Long Beach, CA 90806	Child Care
130	390533	3740347	LONG BEACH CHILD DEVELOPMENT CENTER	2222 OLIVE AVE	Long Beach, CA 90806	Child Care
131	391238	3739449	LONG BEACH CITY COLLEGE CHILD DEVELOPMENT-PCC	1305 E. PACIFIC COAST HWY.	Long Beach, CA 90806	Child Care
132	390344	3741430	Long Beach Day Nursery	2801 Atlantic Ave	Long Beach, CA 90806	Child Care
133	388856	3738266	Lucy's Baby Care	940 Maine Ave	Long Beach, CA	Child Care

Receptor No.	UTM X (m)	UTM Y (m)	Receptor Description	Street Address	City, State, Zip	Category
					90813	
134	382973	3739597	Munchkin Center	1348 N Marine Ave	Wilmington, CA 90744	Child Care
135	391193	3739243	My Three Kids Tons of Fun Day Care	1240 E 17th St	Long Beach, CA 90813	Child Care
136	389258	3739250	N 2 Lil Folkz	1624 Chestnut Ave	Long Beach, CA 90813	Child Care
137	382152	3737824	New Harbor Vista Child Development Center	909 W D St	Wilmington, CA 90744	Child Care
138	378944	3734805	Nursery Rhymes Day Care	1410 W. Ofarrell St	San Pedro, CA 90732	Child Care
139	389533	3741212	Oakwood Children's Center	2650 Pacific Ave	Long Beach, CA 90806	Child Care
140	378566	3732624	Ocean View Preschool	1900 S. Western Ave	San Pedro, CA 90732	Child Care
141	388859	3742514	Old King Cole Day Care	3300 Oregon Ave	Long Beach, CA 90806	Child Care
142	391720	3737833	Ole King Cole Dev Center	1814 E 7th St	Long Beach, CA 90813	Child Care
143	392206	3737391	Our Saviour's Lutheran Preschool	370 Junipero Ave	Long Beach, CA 90814	Child Care
144	389020	3739872	P.A.L. Family Day Care	1980 Daisy Ave	Long Beach, CA 90806	Child Care
145	389472	3740264	PACIFIC HEAD START	2179 PACIFIC AVE	Long Beach, CA 90806	Child Care
146	379181	3735610	Park Western Place Children's Center	1220 Park Western Pl	San Pedro, CA 90732	Child Care
147	393415	3737474	Phases - An Early Learning Comp.	404 Newport Ave	Long Beach, CA 90814	Child Care
148	389579	3738221	PINE HEAD START	927 PINE AVE.	Long Beach, CA 90813	Child Care
149	388059	3738658	PLAY HOUSE, THE	1301 W. 12TH STREET	Long Beach, CA 90813	Child Care
150	380385	3733112	Robin's Nest Day Care	645 W. 14th St	San Pedro, CA 90731	Child Care
151	389036	3741241	Ruiz Family Daycare	2670 Daisy Ave	Long Beach, CA 90806	Child Care
152	379775	3731051	San Pedro - Wilmington Early Education Center	920 W. 36th St	San Pedro, CA 90731	Child Care
153	383537	3739930	Sanchez Family Child Care	1443 Deepwater Ave	Wilmington, CA 90744	Child Care
154	387465	3742345	Sanders Teeny Tiny Preschool	3211 Santa Fe Ave	Long Beach, CA 90810	Child Care
155	391533	3740443	SIGNAL HILL HEAD START	2285 WALNUT AVENUE	Long Beach, CA 90806	Child Care
156	393117	3738872	SIMPLY KARE CHILD DEVELOPMENT CENTER	1406 OBISPO AVENUE	Long Beach, CA 90804	Child Care
157	390623	3740004	Smart & Manageable	2054 Myrtle Ave	Long Beach, CA 90806	Child Care
158	378296	3733672	St. Peter's Episcopal Day	1648 W. 9th St	San Pedro, CA	Child Care

Receptor No.	UTM X (m)	UTM Y (m)	Receptor Description	Street Address	City, State, Zip	Category
			School		90731	
159	389847	3741751	Tender Child Care	211 E 29th St	Long Beach, CA 90806	Child Care
160	380473	3734491	Toberman Child Care Center	131 N. Grand Ave	San Pedro, CA 90731	Child Care
161	391450	3738224	Vincent Family Child Care	925 Walnut Ave	Long Beach, CA 90813	Child Care
162	383041	3739433	VOA/CESAR CHAVEZ HEAD START	1269 N. AVALON STREET	Wilmington, CA 90744	Child Care
163	379899	3739740	Volunteers of America-Parent Child Center	1135 257th St	Harbor City, CA 90710	Child Care
164	389193	3738664	WEST ANAHEIM CHILD CARE CENTER	440 W. ANAHEIM STREET	Long Beach, CA 90813	Child Care
165	387452	3740167	West Child Development Center	2125 Santa Fe Ave.	Long Beach, CA 90810	Child Care
166	384704	3739154	Wilmington Park Children's Center	1419 E Young St	Wilmington, CA 90744	Child Care
167	381437	3734112	World Tots LA Day Care Center	100 W. 5th St	San Pedro, CA 90731	Child Care
168	390296	3737362	YMCA GLB FAIRFIELD 3RD STREET PRESCHOOL	607 E. 3RD STREET	Long Beach, CA 90802	Child Care
169	389517	3739600	YOUNG HORIZONS CHILD DEVELOPMENT CENTERS	1840 Pacific Ave	Long Beach, CA 90806	Child Care
170	389536	3740757	YOUNG HORIZONS CHILD DEVELOPMENT CENTERS	1840 Pacific Ave	Long Beach, CA 90806	Child Care
171	390248	3737686	YOUNG HORIZONS CHILD DEVELOPMENT CENTERS	1840 Pacific Ave	Long Beach, CA 90806	Child Care
172	389459	3737689	YOUNG HORIZONS/EL JARDIN DE LA FELICIDAD	507 PACIFIC AVE.	Long Beach, CA 90813	Child Care
173	382217	3738795	Yvette's Daycare	815 W. Opp St	Wilmington, CA 90744	Child Care
174	380194	3736308	YWCA Venture Park Pre-School	1921 N. Gaffey St	San Pedro, CA 90731	Child Care
175	389978	3741459	Earl & Lorraine Miller Children's Hospital; Long Beach Memorial Medical Center and Hospital	2801 Atlantic Ave	Long Beach, CA 90806	Hospital
176	381348	3733563	Harbor View House	921 S. Beacon St	San Pedro, CA 90731	Hospital
177	380022	3739531	Kaiser Permanente Foundation Hospital	25825 S. Vermont Ave	Harbor City, CA 90710	Hospital
178	379142	3733893	Little Company of Mary San Pedro Hospital	1300 W. 7th St	San Pedro, CA 90732	Hospital
179	389449	3739338	Long Beach Doctors Hospital	1725 Pacific Ave	Long Beach, CA	Hospital

Receptor No.	UTM X (m)	UTM Y (m)	Receptor Description	Street Address	City, State, Zip	Category
					90813	
180	389539	3741329	Pacific Hospital of Long Beach (Hospital and Convalescent/Nursing Home)	2776 Pacific Ave	Long Beach, CA 90806	Hospital
181	378675	3738902	Palos Verdes Health Care Center	26303 Western Ave	Lomita, CA 90717	Hospital
182	379012	3733899	San Pedro Peninsula Hospital	1300 W. 7th St	San Pedro, CA 90732	Hospital
183	390167	3738394	St Mary Medical Center (Hospital and Convalescent/Nursing Home)	1050 Linden Ave	Long Beach, CA 90813	Hospital
184	389215	3739462	Tom Redgate Memorial Hospital	1775 Chestnut Ave	Long Beach, CA 90813	Hospital
185	390353	3741373	Akin's Post Acute Rehab Hospital; Atlantic Memorial Healthcare Center	2750 Atlantic Ave	Long Beach, CA 90806	Convalescent
186	390863	3737410	BELLAGIO MANOR	1046 EAST 4TH ST.	Long Beach, CA 90802	Convalescent
187	389789	3736894	BREAKERS OF LONG BEACH, THE	210 E OCEAN BLVD	Long Beach, CA 90802	Convalescent
188	392607	3736849	BROADWAY BY THE SEA	2725 EAST BROADWAY	Long Beach, CA 90803	Convalescent
189	387455	3740696	BURNETT HOME CARE	1740 WEST BURNETT ST.	Long Beach, CA 90810	Convalescent
190	390450	3740328	CARUTHERS ROYALE CARE	2204 LIME AVE.	Long Beach, CA 90806	Convalescent
191	391831	3737625	Colonial Care Center	1913 E. 5th St.	Long Beach, CA 90802	Convalescent
192	392139	3739609	Courtyard Care Center	1880 Dawson Avenue	Long Beach, CA 90806	Convalescent
193	391831	3737516	CROFTON MANOR INN	1950 E. 5TH ST.	Long Beach, CA 90802	Convalescent
194	380445	3733657	Crow Flora Boarding & Care Homes	624 W. 9th St	San Pedro, CA 90731	Convalescent
195	389709	3742434	DELUXE GUEST HOME	3260 PINE AVE.	Long Beach, CA 90806	Convalescent
196	389709	3742485	DELUXE GUEST HOME II	3266 PINE AVENUE	Long Beach, CA 90806	Convalescent
197	392556	3737484	EDGEWATER CONVALESCENT HOSPITAL	2625 EAST FOURTH STREET	Long Beach, CA 90814	Convalescent
198	389119	3738782	Harbor View Rehabilitation Center	490 W. 14TH Street	Long Beach, CA 90813	Convalescent
199	389648	3738051	HEALTHVIEW - PINE VILLA ASSISTED LIVING	117 EAST 8TH STREET	Long Beach, CA 90813	Convalescent
200	378561	3732407	LITTLE SISTERS OF THE POOR	2100 S. Western Ave.	San Pedro, CA 90732	Convalescent
201	387231	3740475	LORAM MANOR	1925 GEMINI STREET	Long Beach, CA 90810	Convalescent
202	378821	3734136	Los Palos Convalescent	1430 W 6th St	San Pedro, CA	Convalescent

Receptor No.	UTM X (m)	UTM Y (m)	Receptor Description	Street Address	City, State, Zip	Category
			Hospital		90731	
203	390456	3738401	OLIVE TREE HOME	1035 OLIVE STREET	Long Beach, CA 90813	Convalescent
204	388555	3741719	RMR RESIDENTIAL CARE FACILITY, LLC	2900 DE FOREST AVENUE	Long Beach, CA 90806	Convalescent
205	389478	3741347	Royal Care Skilled Nursing Center	2725 Pacific Avenue	Long Beach, CA 90806	Convalescent
206	392046	3737494	RUBY'S GUEST HOME	2125 E. 4TH STREET	Long Beach, CA 90814	Convalescent
207	387541	3742481	Santa Fe Convalescent	3294 Santa Fe Ave	Long Beach, CA 90810	Convalescent
208	378848	3734004	Seacrest Convalescent Hospital	1416 W 6th St	San Pedro, CA 90731	Convalescent
209	391434	3738574	Skylight Convalescent Hospital	1201 Walnut Avenue	Long Beach, CA 90813	Convalescent
210	390475	3738176	Villa Maria Care Center	723 E 9th St	Long Beach, CA 90813	Convalescent
211	393252	3736734	VILLA REDONDO CARE HOME	237 REDONDO AVENUE	Long Beach, CA 90803	Convalescent
212	391819	3737006	Wells House	245 CHERRY AVENUE	Long Beach, CA 90802	Convalescent

Figure 3-1. Coarse and Fine Receptor Grids

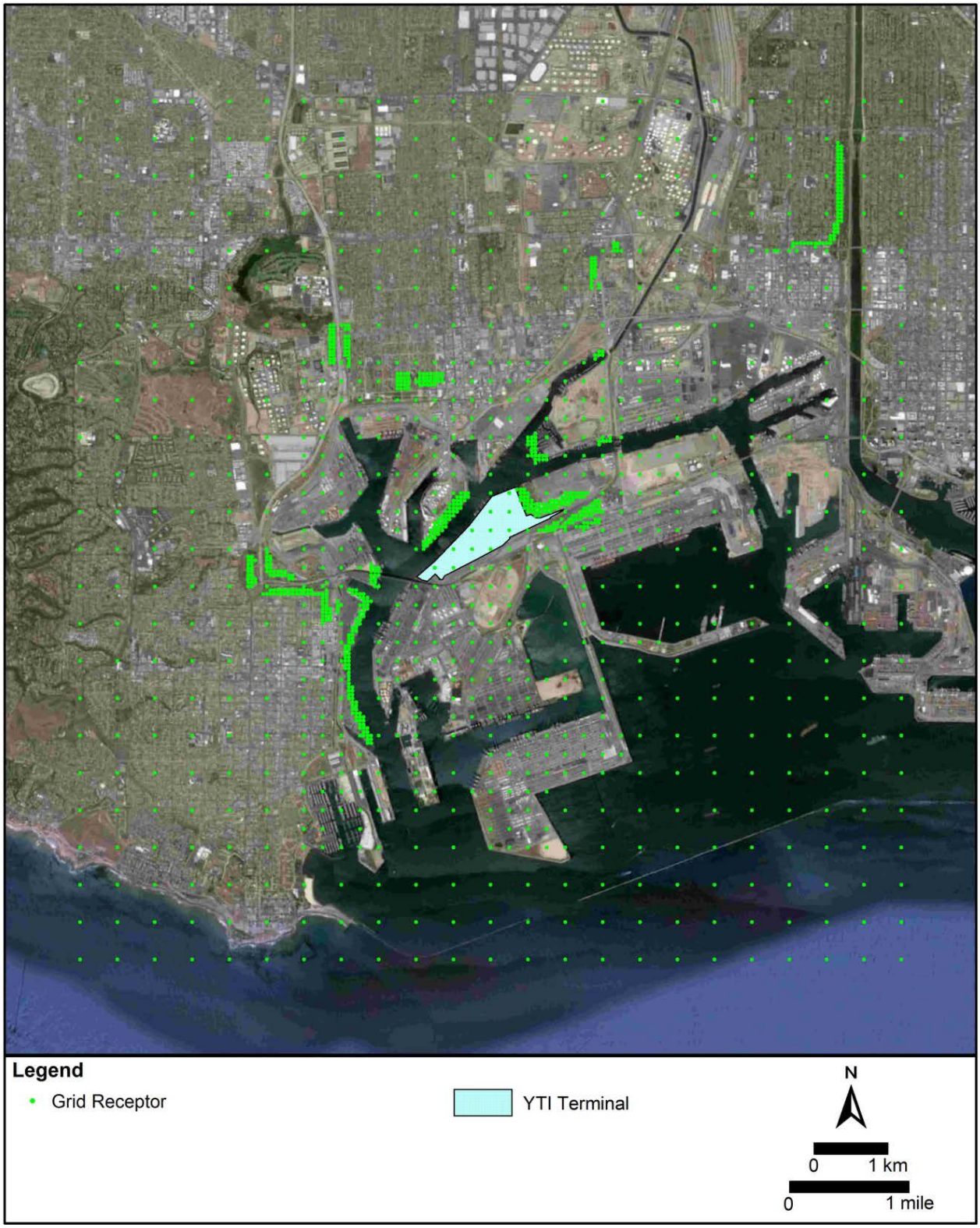
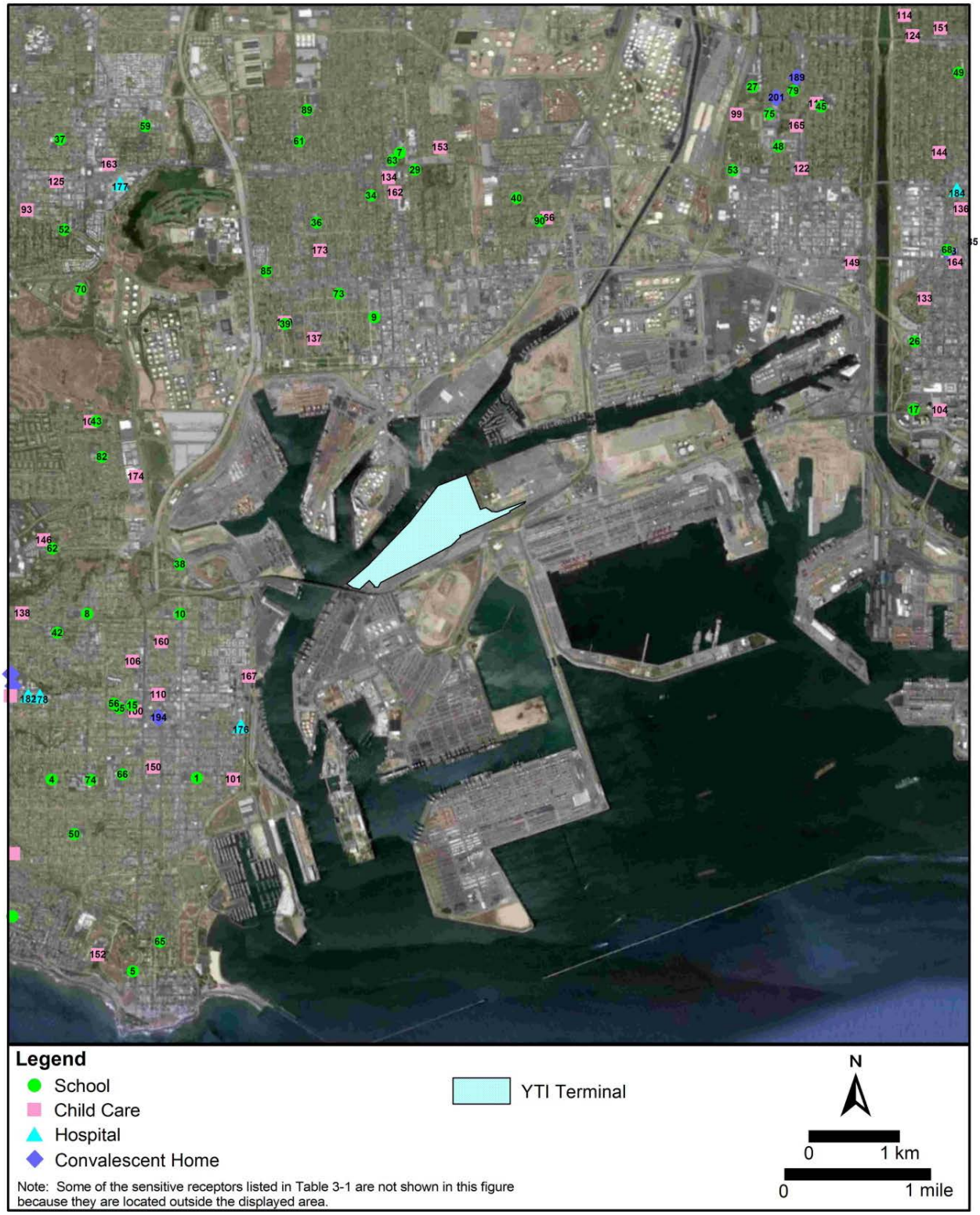


Figure 3-2. Sensitive Receptor Locations



Maximally exposed individual (MEI) locations were selected from the modeled receptor grids for five different receptor types: residential, occupational, sensitive, student, and recreational. The selection methodology for the MEI locations was:

- The residential MEI was selected from all receptors in residential or residentially-zoned areas that did not fall on roads.
- The occupational MEI was selected from all receptors outside the proposed Project boundary that did not fall on roads.
- The sensitive MEI was selected from all identified schools, day care centers, convalescent homes, hospitals, and other identified sensitive receptors in the surrounding area.
- The student MEI was selected from all identified elementary, middle, and high schools in the surrounding area.
- The recreational MEI was selected from all receptors not over water and outside Port of Los Angeles property that did not fall on roads, but including receptors located within the Wilmington and San Pedro Waterfront recreational areas.

4.0 Dispersion Model Selection and Inputs

The air dispersion modeling was performed using the USEPA AERMOD dispersion model, version 12345, based on the Guideline on Air Quality Models (USEPA, 2005). The AERMOD model is a steady-state, multiple-source, Gaussian dispersion model designed for use with emission sources situated in terrain where ground elevations can exceed the stack heights of the emission sources. The AERMOD model requires hourly meteorological data consisting of wind vector, wind speed, temperature, stability class, and mixing height. The selection of the AERMOD model is well suited based on (1) the general acceptance by the modeling community and regulatory agencies of its ability to provide reasonable results for large industrial complexes with multiple emission sources, (2) a consideration of the availability of annual sets of hourly meteorological data for use by AERMOD, and (3) the ability of the model to handle the various physical characteristics of project emission sources, including, point, area, line, and volume source types. AERMOD is approved by the USEPA and SCAQMD for analysis of mobile sources.

4.1 Emission Source Representation

The AERMOD modeling analysis for the HRA evaluated the proposed Project- and alternative-related construction and operational emission sources identified in Sections 2.1 and 2.2. Table 4-1 presents the AERMOD source release parameters for each source type. Appendix B2 presents a more detailed discussion of the development of the source release parameters. For compatibility with the HARP model, the emission sources were grouped in AERMOD and modeled with “unit” emission rates of 1 gram per second. The actual TAC emission rates for each source group were modeled in HARP.

Table 4-1. AERMOD Source Release Parameters

Source Description	AERMOD Source Type	Release Height (m)	Source Spacing (m)	Initial Vertical Dimension (m) [a]	Initial Horizontal Dimension (m) [b]	Exit Velocity (m/s)	Exit Temperature (K)	Stack Diameter (m)
Construction Sources								
Crane delivery ship hoteling – auxiliary engines	point	37.19	--	--	--	9.14	572	0.39
Harbor craft [d]	poly-area	15.24	--	3.54	--	--	--	--
Off-road construction equipment [d]	poly-area	4.57	--	1.06	--	--	--	--
Haul/delivery trucks idling and transiting onsite [d]	poly-area	4.57	--	1.06	--	--	--	--
Asphalt Paving	poly-area	1.0	--	0.23	--	--	--	--
Operational Sources								
Ship transit: propulsion engines, auxiliary engines, auxiliary boilers [e]	volume	59.13	100 in harbor	13.75	46.5			
		49.07	300 in precautionary zone	11.41	139.5	--	--	--
		49.07	1,000 in fairway	11.41	465.1	--	--	--
Ship hoteling: auxiliary engines [e]	point	44.01	--	--	--	7.7	578	0.47
Ship hoteling: boilers [e]	point	44.01	--	--	--	18.2	559	0.49
Ship hoteling at anchorage: auxiliary engines and boilers [e]	poly-area	44.01	--	10.23	--	--	--	--
Tugboats: propulsion and auxiliary engines [f]	volume	15.24	100	3.54	46.5	--	--	--
Locomotives transit: day (6am-6pm)	volume	5.6 [g]	50	2.60 [h]	23.3	--	--	--
Locomotives transit: night (6pm-6am)	volume	14.6 [g]	50	6.79 [h]	23.3	--	--	--
Container trucks: idling at in/out gate, driving on terminal [i]	poly-area	4.57	--	1.06	--	--	--	--
Container trucks transit offsite	line	4.57	--	1.06	--	--	--	--
Cargo handling equipment, TRUs [i]	poly-area	4.57	--	1.06	--	--	--	--
Worker vehicles onsite [g]	poly-area	0.61	--	1.06	--	--	--	--
Worker vehicles off-sit[e]	line	0.61	--	1.06	--	--	--	--

Notes:

a. The initial vertical dimension of the plume (σ_z) was estimated by dividing the initial vertical thickness by 4.3 for elevated releases and by 2.15 for ground-based releases.

b. The initial horizontal dimension (σ_y) is the source spacing divided by a standard deviation of 2.15.

c. Crane delivery ship hoteling was modeled using the point source parameters for a <3,000 TEU hoteling container ship, as compiled by LAHD (LAHD 2008).

d. Release height and initial vertical dimension are consistent with prior LAHD documents (LAHD 2008; LAHD 2011a).

e. Source of ship parameters: LAHD APL EIR/EIS for release height and China Shipping EIR/EIS for other parameters.

f. Source of tugboat parameters: LAHD APL EIR/EIS for release height.

g. Source of locomotive release height: Roseville Railyard Study, page G-3.

h. Source: Roseville Railyard Study divided source height by 2.15 (page 40).

Source Description	AERMOD Source Type	Release Height (m)	Source Spacing (m)	Initial Vertical Dimension (m) [a]	Initial Horizontal Dimension (m) [b]	Exit Velocity (m/s)	Exit Temperature (K)	Stack Diameter (m)
i. Consistent with prior LAHD documents. j. Source of worker vehicle parameters: Consistent with LAHD recommendations (LAHD 2012b).								

Appendix B2 Figures 3-1A and 3-1B show the sizes and locations of the modeled emission sources over a base map of the project vicinity.

4.2 Meteorological Data

The dominant terrain features and water bodies that may influence wind patterns in this part of the Los Angeles Basin include the Pacific Ocean to the west, the hills of the Palos Verdes Peninsula to the west/southwest, and the San Pedro Bay and shipping channels to the south of the study area. Although the area in the immediate vicinity of the Ports of Los Angeles (POLA or the Port) and Long Beach (POLB) is generally flat, these terrain features water bodies may result in significant variations in wind patterns over relatively short distances (LAHD 2010).

POLA and POLB currently operate monitoring stations that collect meteorological data from several locations within port boundaries. The data sets contain hourly observations of wind speed, wind direction, temperature, atmospheric stability, and mixing height recorded at each of the monitoring stations in the network. The meteorological data stations to the west of the Palos Verdes Hills and within approximately 5 kilometers of the San Pedro Bay generally exhibit predominant winds from the northwest and from the south or southeast. The consistency of the predominant winds among these stations indicates that the Palo Verdes Hills are channeling the winds from the northwest and that the San Pedro Bay and shipping channels influence the winds from the south and southeast (LAHD 2010).

For this dispersion analysis, the meteorological data collected at the Terminal Island Treatment Plant (TITP) was used for dispersion modeling. TITP is located just south of the YTI terminal on Pier 300, less than 0.5 miles from the center of the YTI terminal. The data used was collected between September 2006 and August 2007, and was processed and provided by Environ (Environ 2013).

The meteorological data were processed using the USEPA's approved AERMET (version 12345) meteorological data preprocessor for the AERMOD dispersion model. AERMET uses three steps to preprocess and combine the surface and upper-air soundings to output the data in a format which is compatible with the AERMOD model. The first step extracts the data and performs a brief quality assurance check of the data. The second step merges the meteorological data sets. The third step outputs the data in AERMOD-compatible format while also incorporating surface characteristics surrounding the collection or application site.

The output from the AERMET model consists of two separate files: the surface conditions file and a vertical profile dataset. AERMOD utilizes these two files in the dispersion modeling algorithm to predict pollutant concentrations resulting from a source's emissions.

As part of the effort to process the 2006-2007 meteorological data for the latest version of AERMOD (version 12345), the data were compared to the more recent meteorological data collected during years 2009 to 2012. It was determined that the 2006-2007 data period is representative in comparison to the 2009 to 2012 data period. To reach this conclusion, Environ evaluated the completeness of the data by quarter, the average wind speed, and visually examined the wind pattern based on wind roses. The evaluation showed that the average wind speed and wind pattern of the original data period is very similar to that of the 2009 to 2012 data period across the stations at both POLA and POLB. Therefore it was concluded that the original data period is representative (Environ 2013).

4.3 Model Options

Regulatory default technical options were selected for the AERMOD model. Use of these options follows the USEPA modeling guidance (USEPA, 2009; and 40 CFR, Appendix W; November 2005). Receptor and source base elevations were determined from USGS National Elevation Dataset (NED) files using AERMAP, version 11103 (USEPA 2011). All coordinates were referenced to UTM NAD83, Zone 11.

Table 4-2 presents the temporal distribution of emissions used in AERMOD for estimating peak 1-hour and annual average concentrations for the HRA. Emissions were assumed to be uniformly distributed during the specific time periods described in the table. The temporal distribution assumptions are identical for the CEQA baseline, NEPA baseline, proposed Project, and project alternatives.

Table 4-2. Temporal Distribution of Emissions for CEQA Baseline, NEPA Baseline, Proposed Project, and Alternatives.

Source Description	Temporal Distribution
Construction-related sources on land [a]	7:00 am – 6:00 pm
Construction-related sources over water [a]	24 hours per day
Ships Hoteling	24 hours per day
Ships Transiting	24 hours per day
Tugboats assisting ships	24 hours per day
Container Trucks [b]	10 percent 6:00 am – 9:00 am 42 percent 9:00 am – 3:00 pm 18 percent 3:00 pm – 7:00 pm 30 percent 7:00 pm – 6:00 am
Locomotives	24 hours per day
Cargo Handling Equipment	7:00 am – 3:00 am
Transport Refrigeration Units	24 hours per day
Worker Trips [b]	23 percent 6:00 am – 9:00 am 29 percent 9:00 am – 3:00 pm 34 percent 3:00 pm – 7:00 pm 14 percent 7:00 pm – 6:00 am

Notes:
a. There is no construction for the CEQA baseline and Alternative 1.
b. The temporal distributions for container trucks and worker trips were derived from the traffic study (Appendix D).

5.0 Calculation of Health Risks

This HRA used HARP Version 1.4f to perform all health risk calculations based on the concentrations per unit emission rate predicted by AERMOD. HARP calculated values for individual lifetime cancer risk, chronic hazard index, and acute hazard index at each modeled receptor for the CEQA baseline, NEPA baseline, and proposed Project alternatives. Because HARP is not directly compatible with AERMOD output file format, it was necessary to reformat the AERMOD output using the ARB's HARP On-Ramp software (CARB 2009) prior to running HARP.

5.1 Toxicity Factors

An inhalation cancer potency factor represents the probability that a person will contract cancer from the continuous inhalation of one milligram (mg) of a chemical per kilogram (kg) of body weight per day over a period of 70 years. Inhalation potency factors were used by HARP to calculate individual lifetime cancer risk using the risk assessment algorithms defined in OEHHA (OEHHA 2003).

To assess the potential for non-cancer health effects resulting from chronic and acute inhalation exposure, OEHHA has established RELs (CARB 2013). An REL is an estimate of the continuous inhalation exposure concentration to which the human population (including sensitive subgroups) may be exposed without appreciable risk of experiencing adverse non-cancer effects. The chronic hazard index is the sum of the chemical-specific chronic hazard quotients affecting a particular target organ. The acute hazard index is the sum of the chemical-specific acute hazard quotients affecting a particular target organ. A hazard quotient is a chemical's predicted concentration divided by its REL. A separate hazard index is calculated for each target organ affected by the TACs because not all TACs affect the same target organ. A hazard index below 1.0 for all affected target organs indicates that adverse non-cancer health effects are not expected.

In addition to the inhalation exposure pathway, several noninhalation exposure pathways were also incorporated in the HRA, including dermal adsorption, soil ingestion, home-grown produce ingestion (residential and sensitive receptors only), and mother's milk ingestion (residential and sensitive receptors only). The TACs evaluated for noninhalation pathways include arsenic, cadmium, hexavalent chromium, lead, mercury, and nickel from all sources except diesel IC engines. For diesel IC engines, the inhalation toxicity factors for DPM already include the effects from exposure to whole diesel exhaust, so a separate evaluation of noninhalation pathways is unnecessary. The various exposure parameters and settings used in HARP for the noninhalation exposure pathways are consistent with SCAQMD guidelines (SCAQMD 2005). The results of this analysis show that the contributions of the noninhalation exposure pathways to the HRA results are negligible compared to the inhalation pathway. Table 5-1 presents the toxicity factors used in this HRA.

Table 5-1. Toxicity Factors Used in the HRA

Toxic Air Contaminant	HARP TAC ID	Inhalation Cancer Potency Factor $(mg/kg\text{-}d)^{-1}$	Chronic Inhalation REL ($\mu g/m^3$)	Target Organ for Chronic Exposure	Acute Inhalation REL ($\mu g/m^3$)	Target Organ for Acute Exposure
Acetaldehyde	75070	0.01	140	I	470	D,I
Acrolein	107028	—	0.35	I	2.5	D,I
Ammonia	7664417	—	200	I	3,200	D,I
Arsenic [b]	7440382	12	0.015	B,C,G,I,J	0.2	B,C,G
Benzene	71432	0.1	60	C,E,G	1,300	E,F,C
1,3-Butadiene	106990	0.6	2	C	660	C
Cadmium [b]	7440439	15	0.02	I,M	—	—
Chlorine	7782505	—	0.2	I	210	D,I
Chlorobenzene	108907	—	1,000	A,C,M	—	—
Copper	7440508	—	—	—	100	I
Diesel PM (DPM) [a]	9901	1.1	5	I	—	—
Ethylbenzene	100414	0.0087	2,000	A,C,L,M	—	—
Formaldehyde	50000	0.021	9	I	55	D
n-Hexane	110543	—	7,000	G	—	—
Hexavalent Chromium [b]	18540299	510	0.2	E,I	—	—
Lead [b]	7439921	0.042	—	—	—	—
Manganese	7439965	—	0.09	G	—	—
Mercury [b]	7439976	—	0.03	C,G,M	0.6	C,G
Methyl Alcohol	67561	—	4,000	C	28,000	G
Methyl Ethyl Ketone	78933	—	—	—	13,000	D,I
Naphthalene	91203	0.12	9	I	—	—
Nickel [b]	7440020	0.91	0.014	C,E,I	0.2	F
Propylene	115071	—	3,000	I	—	—
Selenium	7782492	—	20	A,B,G	—	—
Styrene	100425	—	900	G	21,000	C,D,I
Sulfates	9960	—	—	—	120	I
Toluene	108883	—	300	C,G,I	37,000	C,D,G,I
Vanadium	7440622	—	—	—	30	D,I
Xylenes	1330207	—	700	D,G,I	22,000	D,G,I

Notes:

[a] For diesel internal combustion engines, only DPM emissions were evaluated for cancer risk and chronic hazard indices, because DPM is a surrogate for the combined health effects associated with exposure to diesel exhaust emissions. For all other emission sources, emissions of the 28 other toxic air contaminants were evaluated for cancer risk and chronic hazard indices. For the acute hazard indices, DPM was not evaluated; rather, emissions of the 28 other toxic air contaminants were evaluated for all emission sources (including diesel internal combustion engines).

[b] Arsenic, cadmium, hexavalent chromium, lead, mercury, and nickel were also evaluated for noninhalation exposure pathways. For arsenic, the cancer risk oral slope factor is 1.5 $(mg/kg/day)^{-1}$, and the noncancer chronic oral REL is 0.0000035 mg/kg/day. For cadmium, the noncancer chronic oral REL is 0.0005 mg/kg/day. For hexavalent chromium, the cancer risk oral slope factor is 0.5 $(mg/kg/day)^{-1}$, and the noncancer chronic oral REL is 0.02 mg/kg/day. For lead, the cancer risk oral slope factor is 0.0085 $(mg/kg/day)^{-1}$. For mercury, the noncancer chronic oral REL is 0.00016 mg/kg/day. For nickel, the noncancer chronic oral REL is 0.011 mg/kg/day. The deposition rate was assumed to be the HARP default of 0.02 meters per second (controlled sources).

[c] Key to non-cancer acute and chronic exposure target organs:

A. Alimentary Tract
B. Cardiovascular System
C. Reproductive/Developmental System
D. Eye
E. Hematologic System
F. Immune System
G. Nervous System
I. Respiratory System
J. Skin
K. Bone
L. Endocrine System
M. Kidney

5.2 Mortality and Morbidity

The LAHD has previously included analyses of PM-related mortality in the TraPac, China Shipping, and San Pedro Waterfront EIRs. The latter two documents utilized a methodology published by CARB (2006b), which was primarily developed for large geographic areas such as air basins or the entire state. In 2008, CARB noted that the methods for applying calculations of mortality to a project-level scale were not fully developed, and that such applications should include explicit statements regarding the uncertainties and limitations. Notwithstanding these uncertainties, the LAHD has received requests from individuals, environmental groups, the SCAQMD, OEHHA, and the CARB to include separate quantitative assessments of project-related PM-attributable mortality as well as morbidity in their CEQA analyses.

In response to these requests LAHD developed a methodology to calculate mortality and morbidity from project emissions (LAHD 2011b), which generally follows the approach used by CARB to estimate state-wide health impacts from ports and goods movement in California (CARB 2006a and CARB 2006b), incorporating CARB's methodology for mortality (CARB 2010). In the 2006 analysis, CARB focused on PM and ozone because these are the criteria pollutants for which sufficient evidence of mortality and morbidity effects exists. Modeling changes in ozone concentrations usually requires information on emissions from all sources within a region (for example, the SCAB), and is therefore not considered appropriate for project-level analyses. Therefore, the methodology for project-level studies conducted for LAHD CEQA documents focuses on the health effects associated with changes in PM concentrations. Focusing on PM is also consistent with CARB studies of mortality and morbidity impacts from California ports (CARB 2006a, CARB 2006b, and CARB 2010).

The SCAQMD's localized significance threshold for a 24-hour $PM_{2.5}$ concentration is 2.5 $\mu g/m^3$ for operational impacts (SCAQMD 2011b). This value is only 7 percent of the 24-hour NAAQS and 21 percent of the annual CAAQS (there is no 24-hour CAAQS for $PM_{2.5}$). This value is based on CARB guidance and epidemiological studies showing significant toxicity (resulting in mortality and morbidity) related to exposure to fine particles. Because mortality and morbidity studies represent major inputs used by CARB and USEPA to set CAAQS and NAAQS, project-level mortality and morbidity is presented in LAHD CEQA documents as a further elaboration of local PM impacts which are already addressed. Therefore, mortality and morbidity is quantified only if a $PM_{2.5}$ concentration significance finding is identified as part of the air quality impact analysis of project operation.

If dispersion modeling of ambient air quality concentrations during proposed Project or alternatives operation (Impact AQ-4) identifies a significant impact for 24-hour $PM_{2.5}$ mortality and morbidity would be quantified per the following methodology:

- Mortality is calculated using the relative risk factor of a 10% increase in premature deaths per year (mortality rate) per 10 $\mu g/m^3$ increase in $PM_{2.5}$ concentration (CARB 2008). Morbidity calculations will follow the general methodology and available concentration-response data described by CARB (CARB 2006b).

- Morbidity endpoints that are calculated on an annual basis will be based on project-specific incremental annual $PM_{2.5}$ concentrations (e.g., project minus Baseline). Morbidity endpoints that require estimates of daily impacts will be based on daily average $PM_{2.5}$ concentrations. The specific health effects endpoints evaluated include:
  - Hospital admissions for chronic obstructive pulmonary disease;
  - Hospital admissions for pneumonia;
  - Hospital admissions for cardiovascular disease;
  - Acute bronchitis;
  - Hospital admissions for asthma;
  - Emergency Room visits for asthma;
  - Asthma attacks;
  - Lower respiratory symptoms;
  - Work loss days; and
  - Minor restricted activity days.

To address mortality and morbidity over the multiple years of a project's lease, the annual incidence for each endpoint will be summed to provide an estimate of the aggregate effects attributable to a project's incremental PM emissions.

Since the adoption of the LAHD methodology for evaluating morbidity and mortality, CARB has updated its approach to estimating premature death associated with exposure to fine particulate matter (CARB 2010). In the updated methodology, CARB relies on the current methods outlined by USEPA (USEPA 2010) in Quantitative Health Risk Assessment for Particulate Matter, from which CARB integrated several key factors. Three key elements of this updated approach include: a) limiting the evaluation to cardiovascular disease-related mortality, b) adoption of an annual average $PM_{2.5}$ threshold concentration of 5.8 $\mu g/m^3$ ("CARB $PM_{2.5}$ threshold") for quantifying mortality, and c) revision of the coefficient used to relate mortality to changes in $PM_{2.5}$ concentrations.

5.3 Cancer Burden

Cancer burden is an estimate of the expected number of additional cancer cases in a population exposed to project- or alternative-generated TAC emissions. Whereas cancer risk represents the probability of an individual developing cancer, cancer burden estimates the number of individuals that could be expected to contract cancer. The cancer burden is calculated by multiplying the individual lifetime cancer risk increment by the population exposed to that level of incremental risk, calculated at the census tract or block level. The exposed population is defined as the number of persons within a facility's zone of impact, which is defined by the LAHD as the area within the facility's one in a million cancer risk isopleth. Consistent with this definition, cancer burden is calculated only if the proposed Project or alternative is associated with cancer risk increments of one in a million or above.

5.4 Exposure Scenarios for Individual Lifetime Cancer Risk

For the cancer risk evaluation, the frequency and duration of exposure to TACs are assumed to be directly proportional to the risk. Therefore, this HRA used specific exposure assumptions for each receptor type, as described below.

Residential and Sensitive Receptors. Cancer risks for residential and sensitive receptors were estimated using the breathing rates described in the CARB Recommended Interim Risk Management Policy for Inhalation-Based Residential Cancer Risk (CARB 2004). The HRA determined residential and sensitive receptor cancer risks by using a breathing rate of 302 liters per kilogram day (corresponding to an 80th percentile value) and an exposure duration of 24 hours per day, 350 days per year over 70 years.

Occupational Impacts. Workers generally do not spend as much time within the region of a project as do residents. The SCAQMD, therefore, allows an exposure adjustment for workers (SCAQMD 2005). Lifetime occupational exposure is based on a worker presence of 8 hours per day, 245 days per year for 40 years (OEHHA 2003). The breathing rate for workers is equal to 447 L/kg-day, which equates to 149 L/kg-day over an 8-hour workday (OEHHA 2003).

Student Impacts. SCAQMD's policy is to evaluate student cancer risk based upon a full 70 years of exposure. However, students actually spend a far more limited portion of their lives at a given school than 70 years. Accordingly, student exposures were calculated based on a student presence of 6 hours per day, 180 days per year for 6 years. The breathing rate of children is equal to 581 L/kg-day (OEHHA 2003).

Recreational User Impacts. Exposures for recreational users were estimated based on an exposure frequency of 2 hours per day, 350 days per year, and an exposure duration of 70 years. The breathing rate of a person engaged in recreational activities is assumed to be a "heavy activity" rate equal to 1,097 L/kg-day, which was obtained from the USEPA Exposure Factors Handbook (USEPA 1997).

Table 5-2 summarizes the primary exposure assumptions used to calculate individual lifetime cancer risk by receptor type.

Table 5-2. Exposure Assumptions for Individual Lifetime Cancer Risk

Receptor Type	Exposure Frequency		Exposure Duration	Breathing Rate
	(Hours/Day)	(Days/Year)	(Years)	(L/kg-day)
Residential	24	350	70	302
Occupational	8	245	40	447
Sensitive	24	350	70	302
Student	6	180	6	581
Recreational	2	350	70	1,097

Notes:
a) The residential breathing rate of 302 L/kg BW-day represents the 80th percentile breathing rate. For informational purposes, residential cancer risks were also calculated for a 95th percentile ("high end") breathing rate of 393 L/kg BW-day (OEHHA 2003).
b) The occupational exposure frequency of 245 days/year represents 5 days/week, 49 weeks/year. The occupational breathing rate of 447 L/kg BW-day equates to 149 L/kg BW-day over an 8-hour work day (OEHHA 2003).
c) The student breathing rate of 581 L/kg BW-day represents the high end child breathing rate (OEHHA 2003).

Receptor Type	Exposure Frequency		Exposure Duration	Breathing Rate
	(Hours/Day)	(Days/Year)	(Years)	(L/kg-day)
d) The recreational breathing rate of 1,097 L/kg BW-day represents a "heavy activity" breathing rate, which is derived from a breathing rate of 3.2 m^3/hr (and assuming a 70-kg adult) as reported in the USEPA Exposure Factors Handbook (USEPA 1997). This recreational breathing rate is conservative because it assumes that an individual could sustain the maximum hourly breathing rate for 2 consecutive hours.				

6.0 Significance Criteria for Project Health Risks

The LAHD has adopted the significance threshold of 10 in a million as being an acceptable level of cancer risk increment for receptors. Based on this threshold, a project would produce less than significant cancer risk impacts if the maximum incremental cancer risk due to the project is less than 10 in 1 million (10×10^{-6}). The LAHD has also adopted the air quality significance threshold for cancer burden of 0.5 excess cancer cases in areas with project-attributable cancer risk above one in a million (1×10^{-6}) (SCAQMD 2011b). In addition, the LAHD has adopted the significance threshold of 1.0 for chronic and acute non-cancer hazard indices; a project would produce less than significant non-cancer impacts if the chronic and/or acute hazard index is less than 1.0 (SCAQMD 2011b).

For the determination of significance from a CEQA standpoint, this HRA determined the incremental change in health effects due to the proposed Project and alternatives by estimating the net change in impacts between each project/alternative scenario and NOP CEQA baseline and Future CEQA baseline conditions. These incremental health effects values were compared to the significance thresholds described above. If either increment (project minus NOP CEQA baseline, or project minus Future CEQA baseline) would exceed a significance threshold, the impact would be considered significant.

For the determination of significance from a NEPA standpoint, this HRA determined the incremental change in health effects due to the proposed Project and alternatives by estimating the net change in impacts between each project/alternative scenario and NEPA baseline condition. These incremental health effects values were compared to the significance thresholds described above.

7.0 Predicted Incremental Health Impacts

7.1 Proposed Project Incremental Impacts

The proposed Project, NOP CEQA Baseline, Future CEQA Baseline, and NEPA Baseline maximum estimated health risks are provided below, as well as the CEQA incremental impact and NEPA incremental impact. Incremental impacts are the proposed Project minus the appropriate baseline.

7.1.1 Unmitigated Impacts

7.1.1.1 CEQA Incremental Impacts

Table 7-1 presents the maximum CEQA health impacts associated with the proposed Project without mitigation. The results for cancer risk include the maximum risk from the proposed Project alone (prior to subtracting baseline), the maximum risk from the NOP CEQA baseline, the maximum NOP CEQA cancer risk increment (Project minus NOP CEQA baseline), the maximum risk from the Future CEQA baseline, and the maximum Future CEQA cancer risk increment (Project minus Future CEQA baseline). The results for chronic and acute noncancer effects include the maximum hazard index from the proposed Project alone (prior to subtracting baseline), the maximum hazard index from the NOP CEQA baseline, and the maximum NOP CEQA hazard index increment (Project minus NOP CEQA baseline). The results for cancer burden include the estimated number of additional cancer cases associated with the proposed Project relative to the NOP CEQA baseline (NOP CEQA increment) and the estimated number of additional cancer cases associated with the proposed Project relative to the Future CEQA baseline (Future CEQA increment). The table shows the following:

- Cancer Risk
  - In relation to the NOP CEQA baseline, the maximum incremental cancer risk is predicted to be less than the significance threshold at all receptor types except the occupational receptor. Cancer risk at the occupational receptor would exceed the significance threshold.

    The maximum impacted occupational receptor would be located about 1,000 feet northeast of the YTI terminal truck out-gate, on industrial Port property, just north of the entry/exit road and TICTF storage tracks. Sources driving impacts at this receptor would be container trucks travelling in and out of the terminal.

  - In relation to the Future CEQA baseline, the maximum incremental cancer risk is predicted to be less than the significance threshold at all receptor types except the marina-based residential and occupational receptors. Cancer risk at the marina-based residential and occupational receptors would exceed the significance threshold.

    The maximum impacted residential receptor would be at the marina live-aboards (locations where people live on boats) in the Cerritos Channel, near Anchorage Street, just west of the Henry Ford and Schuyler Heim bridges. Cancer risk at this receptor would be driven by locomotives traveling across and beyond the Henry Ford Bridge and drayage trucks driving across and beyond the Schuyler Heim Bridge.

    The maximum impacted occupational receptor would be located about 1,000 feet northeast of the YTI terminal truck out-gate, on industrial Port property, just north of the entry/exit road and TICTF storage tracks.

Sources driving impacts at this receptor would be container trucks travelling in and out of the terminal.

Although live-aboard residents would be maximally impacted by the proposed Project, in general, these residents are not expected to stay in their locations for 70 years like traditional land-based residential populations considered under an HRA. Therefore, although residential cancer risk impact determinations were based on the maximum impacted receptors – in this case live-aboard residents – this analysis also identifies, for informational purposes, the impact at the maximum impacted land-side residential receptor.

- Cancer Burden
  - In relation to the NOP CEQA baseline, the cancer burden increment is predicted to be less than the significance threshold.
  - In relation to the Future CEQA baseline, the cancer burden increment is predicted to be less than the significance threshold.
- Chronic and Acute Impacts
  - Because chronic and acute hazard indices are based on annual and peak hour exposures instead of lifetime exposures like cancer risk, they are determined by comparing project-related impacts only to the NOP CEQA baseline, which is the baseline at the time of the NOP in 2012.
  - The maximum chronic hazard index is predicted to be less than significant for all receptor types.
  - The maximum acute hazard index is predicted to be less than significant for all receptor types.
- Particulates: Morbidity and Mortality
  - Operation of the proposed Project would result in a maximum off-site 24-hour $PM_{2.5}$ concentration increment that would not exceed the SCAQMD significance threshold of 2.5 $\mu g/m^3$ (see EIR/EIS Section 3.2.4). Because the operational $PM_{2.5}$ concentrations would be less than significant and would not exceed the Port's criterion for calculating morbidity and mortality attributable to PM, potential mortality and morbidity effects were not quantified for the proposed Project.

Table 7-2 shows the percent contribution to cancer risk for the NOP and Future CEQA increments for each modeled source group associated with residential and offsite occupational exposure. The NOP and Future CEQA increments would be less than 1 for non-cancer chronic and acute impacts and are therefore not presented in the table.

Figure 7-1 shows the locations of the maximally exposed individuals (MEIs) for cancer, chronic non-cancer, and acute non-cancer incremental impacts.

Figure 7-2 through Figure 7-5 show the cancer risk isopleths for the NOP CEQA baseline for residential and occupational receptors, and the Future CEQA baseline for residential and occupational receptors, respectively.

Figure 7-6 through Figure 7-11 show the unmitigated absolute proposed Project cancer risk for residential and occupational receptors, the unmitigated NOP CEQA cancer risk increment for residential and occupational receptors, and the unmitigated Future CEQA cancer risk increment for residential and occupational receptors.

Table 7-1. Maximum Incremental CEQA Health Impacts Associated with the Proposed Project without Mitigation

Health Impact	Receptor Type	Maximum Predicted Impact					Significance Threshold
		Proposed Project	**NOP CEQA Baseline**	**NOP CEQA Increment**	**Future CEQA Baseline**	**Future CEQA Increment**	
Cancer Risk	Residential - on Land	23 × 10-6 23 in a million	26 × 10-6 26 in a million	5 × 10-6 5 in a million	19 × 10-6 19 in a million	6 × 10-6 6 in a million	10 × 10-6 10 in a million
	Residential - in Marina	37 × 10-6 37 in a million	85 × 10-6 85 in a million	<0	25 × 10-6 25 in a million	**11 × 10-6** **11 in a million**	
	Occupational	94 × 10-6 94 in a million	75 × 10-6 75 in a million	**19 × 10-6** **19 in a million**	63 × 10-6 63 in a million	**31 × 10-6** **31 in a million**	
	Sensitive	10 × 10-6 10 in a million	23 × 10-6 23 in a million	<0	8 × 10-6 8 in a million	3 × 10-6 3 in a million	
	Student	0.7 × 10-6 0.7 in a million	0.7 × 10-6 0.7 in a million	0.07 × 10-6 0.07 in a million	0.7 × 10-6 0.7 in a million	0.07 × 10-6 0.07 in a million	
	Recreational	17 × 10-6 17 in a million	39 × 10-6 39 in a million	2 × 10-6 2 in a million	12 × 10-6 12 in a million	5 × 10-6 5 in a million	
Chronic Hazard Index		**Proposed Project**	**NOP CEQA Baseline** [3]	**NOP CEQA Increment** [3]			1
	Residential - on Land	0.09	0.1	<0			
	Residential - in Marina	0.1	0.2	<0			
	Occupational	0.6	0.4	0.2			
	Sensitive	0.08	0.1	<0			
	Student	0.08	0.1	<0			
	Recreational	0.1	0.2	0.004			
Acute Hazard Index	Residential - on Land	0.5	0.4	0.1			1
	Residential - in Marina	0.7	0.6	0.3			
	Occupational	1.1	0.9	0.6			
	Sensitive	0.5	0.3	0.1			
	Student	0.4	0.3	0.1			
	Recreational	0.7	0.6	0.3			

Health Impact	Receptor Type	Maximum Predicted Impact					Significance Threshold
		Proposed Project	NOP CEQA Baseline	NOP CEQA Increment	Future CEQA Baseline	Future CEQA Increment	
Cancer Burden				NOP CEQA Increment		Future CEQA Increment	0.5
				0.002		0.20	

Notes:

1. Exceedances of the significance thresholds are in bold. The significance thresholds apply only to the increments.
2. The NOP CEQA increment represents the Project minus NOP CEQA baseline. The Future CEQA increment represents the Project minus Future CEQA baseline. The Future CEQA baseline and Future CEQA increments are only applicable to cancer risk because cancer risk is based on long-term (multiple-year) exposure periods.
3. Chronic and acute impacts are considered short-term impacts and are determined by comparing project-related impacts to the NOP CEQA baseline, the baseline at the time of the NOP in 2012.
4. Each result shown in the table represents the modeled receptor location with the maximum impact or increment. The impacts or increments at all other receptors would be less than the values in the table.
5. The displayed values for the Project and baseline impacts do not necessarily subtract to equal the displayed CEQA increments because they may occur at different receptor locations.
6. Construction emissions were modeled with the operational emissions for the determination of health impacts.
7. An increment less than zero means the Project impact would be less than the baseline impact at all modeled receptors.

Table 7-2. Source Contributions to Cancer Risk at the CEQA Increment MEIs – Proposed Project without Mitigation

Source Category	Cancer Risk MEI Receptor			
	Residential NOP CEQA Increment	Residential Future CEQA Increment	Occupational NOP CEQA Increment	Occupational Future CEQA Increment
Container Ships - Anchorage	0.2%	0.2%	0.0%	0.0%
Container Ships - Hoteling	1.8%	3.9%	0.7%	0.7%
Container Ships - Transit	3.2%	4.0%	0.6%	0.6%
Container Ships - Total	**5.1%**	**8.2%**	**1.4%**	**1.4%**
Assist Tugboats	**0.2%**	**0.4%**	**0.1%**	**0.1%**
Locomotives	**2.0%**	**64.8%**	**13.3%**	**13.3%**
Container Trucks - Off Site	91.5%	21.7%	80.1%	80.1%
Container Trucks - On Site	0.3%	1.6%	2.8%	2.8%
Container Trucks - Total	**91.8%**	**23.3%**	**82.9%**	**82.9%**
Cargo Handling Equipment	**0.8%**	**2.7%**	**1.2%**	**1.2%**
Construction Activity	**0.1%**	**0.2%**	**0.1%**	**0.1%**
Transport Refrigeration Units	**0.0%**	**0.1%**	**0.1%**	**0.1%**
Worker Trips	**0.1%**	**0.2%**	**0.9%**	**0.9%**

Note: Contributions are from proposed Project sources prior to subtracting baseline.

Figure 7-1. MEI Locations for CEQA Health Increments – Proposed Project without Mitigation

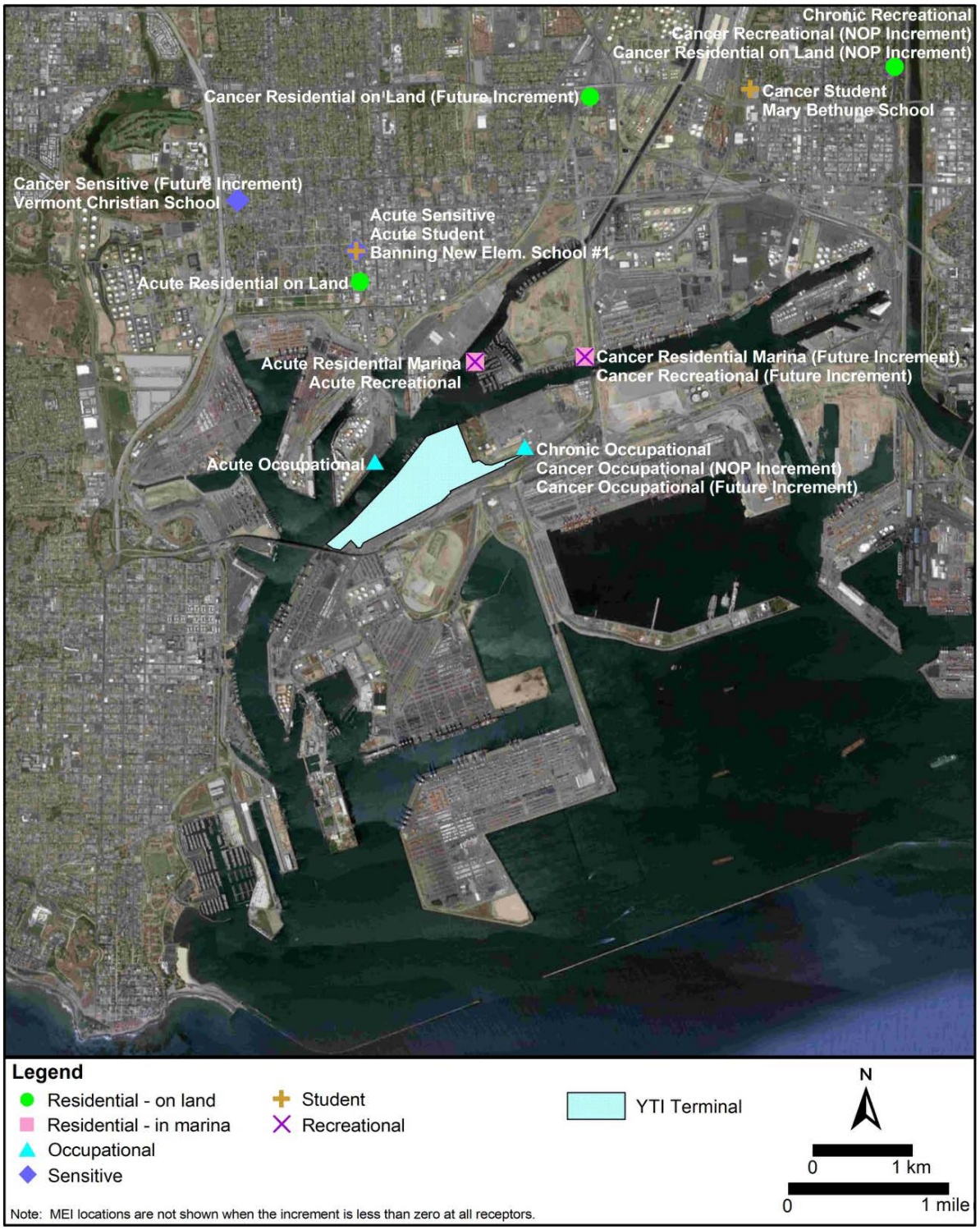


Figure 7-2. Isopleths of Residential Lifetime Cancer Risk: NOP CEQA Baseline

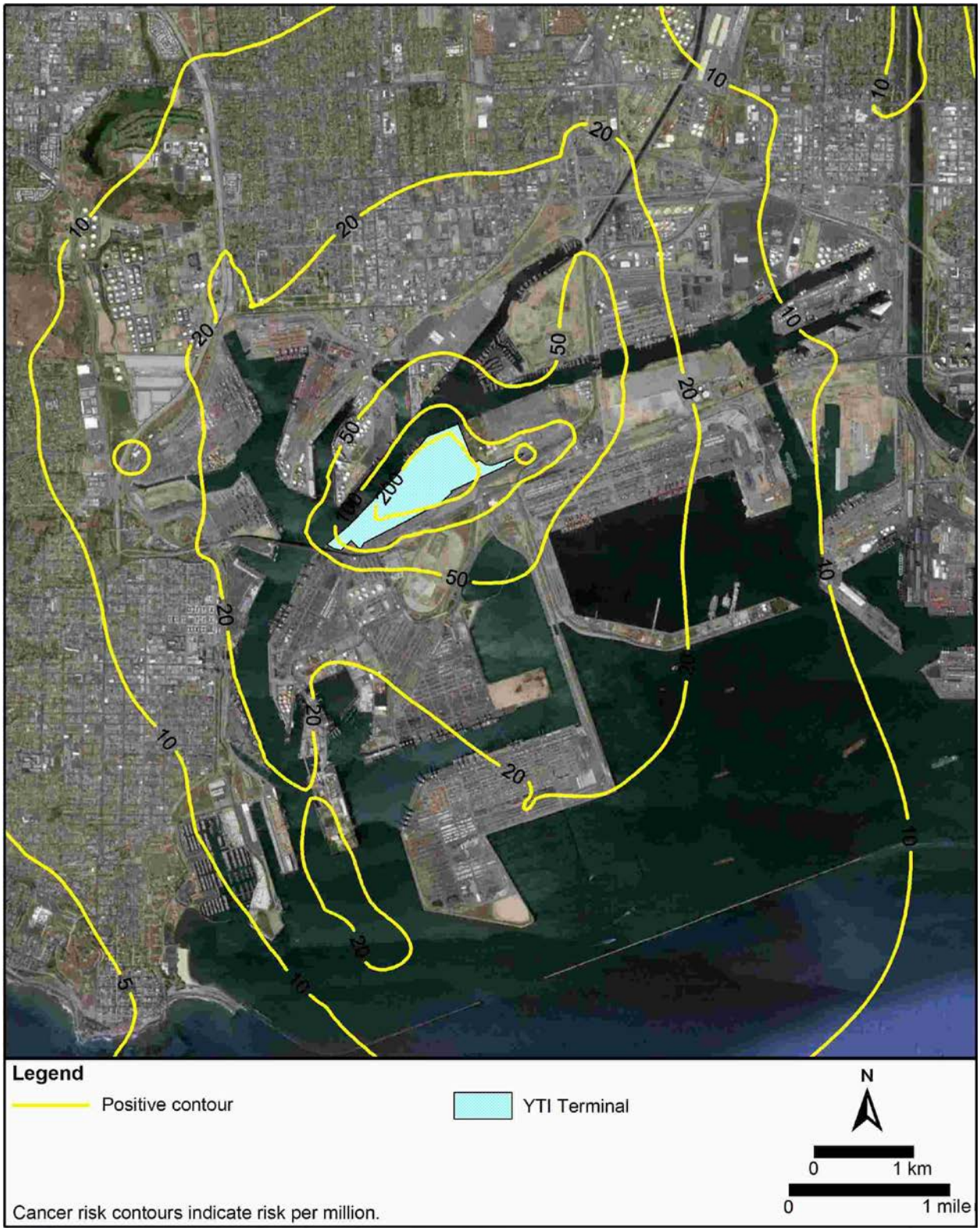


Figure 7-3. Isopleths of Occupational Lifetime Cancer Risk: NOP CEQA Baseline

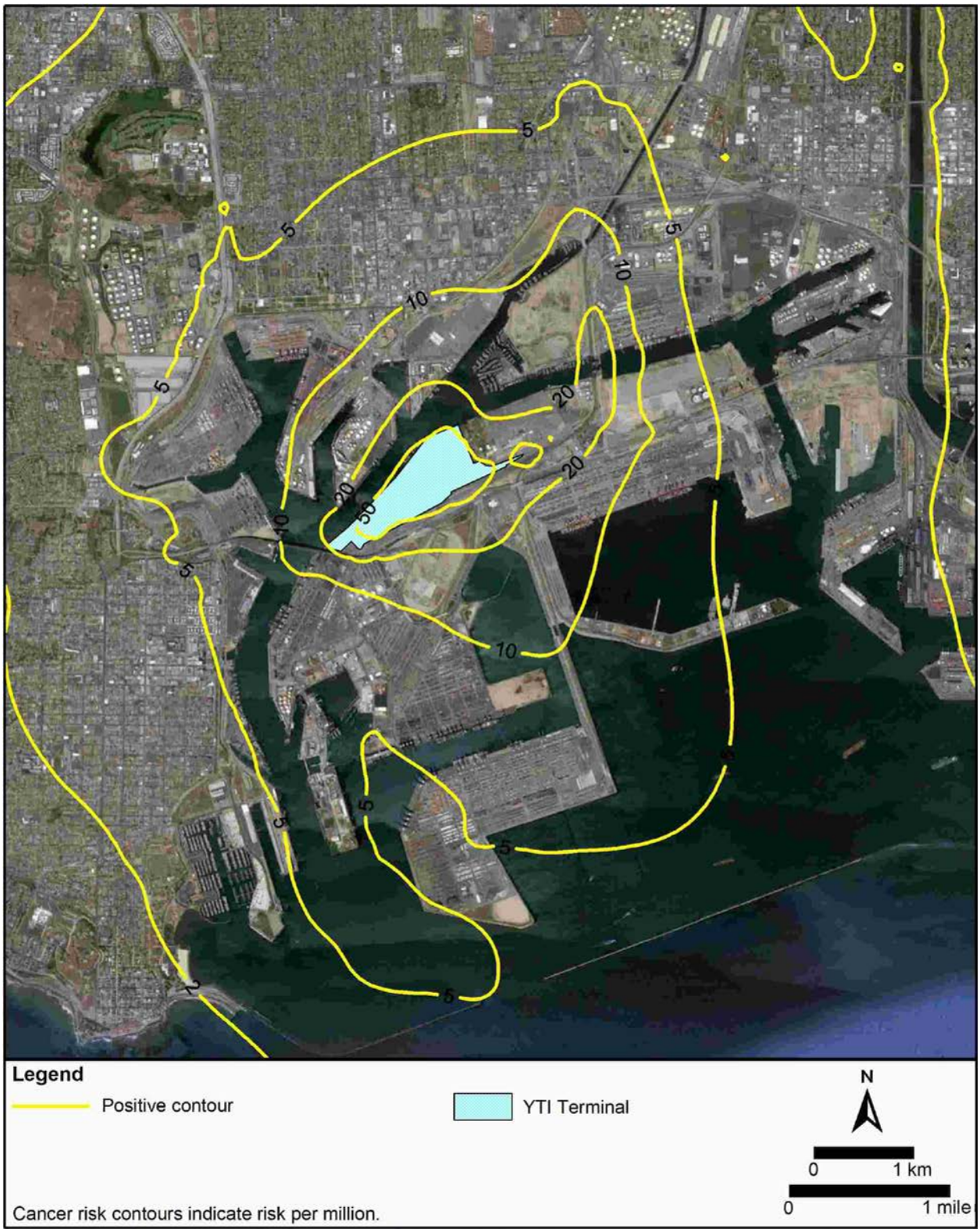


Figure 7-4. Isopleths of Residential Lifetime Cancer Risk: Future CEQA Baseline

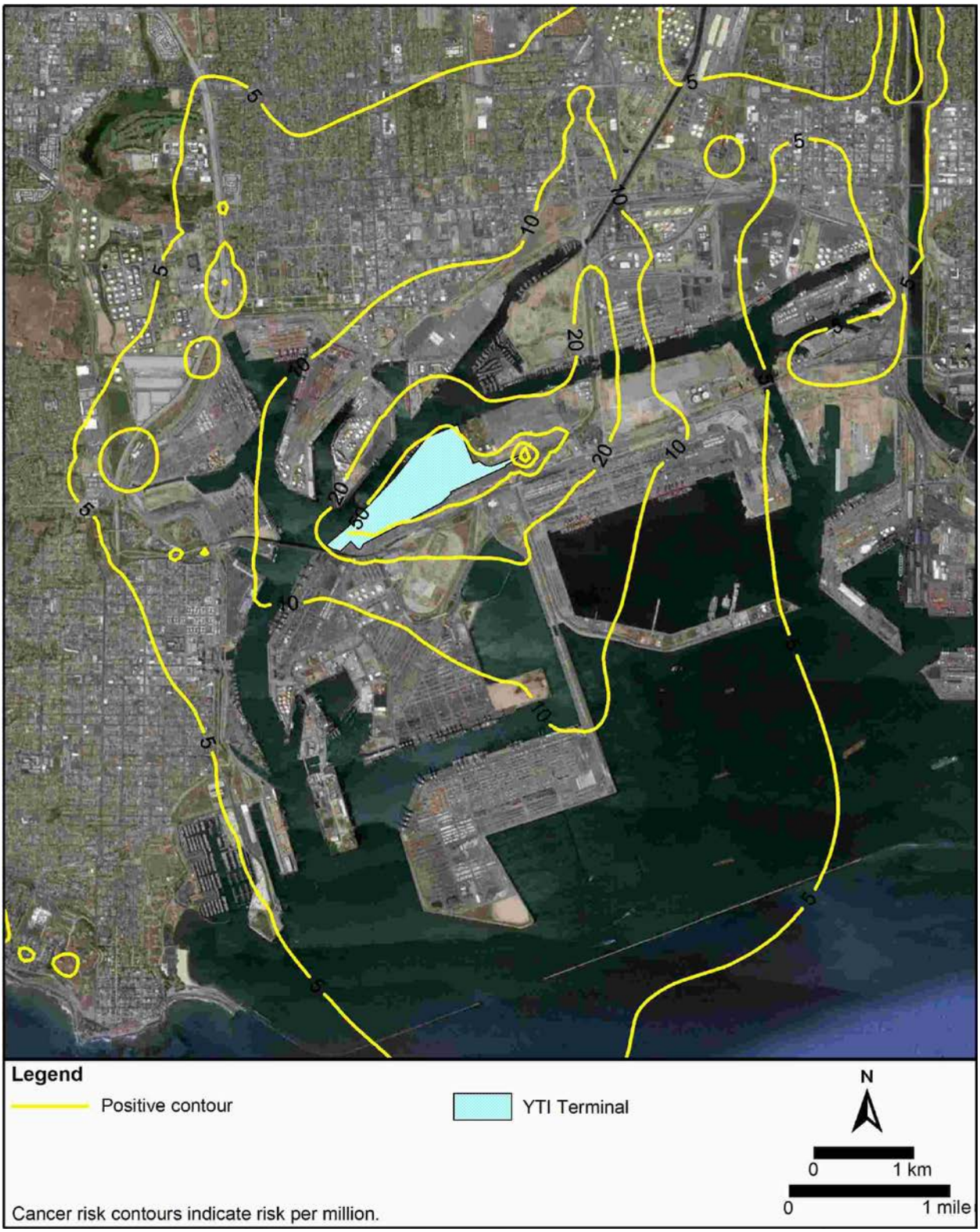


Figure 7-5. Isopleths of Occupational Lifetime Cancer Risk: Future CEQA Baseline

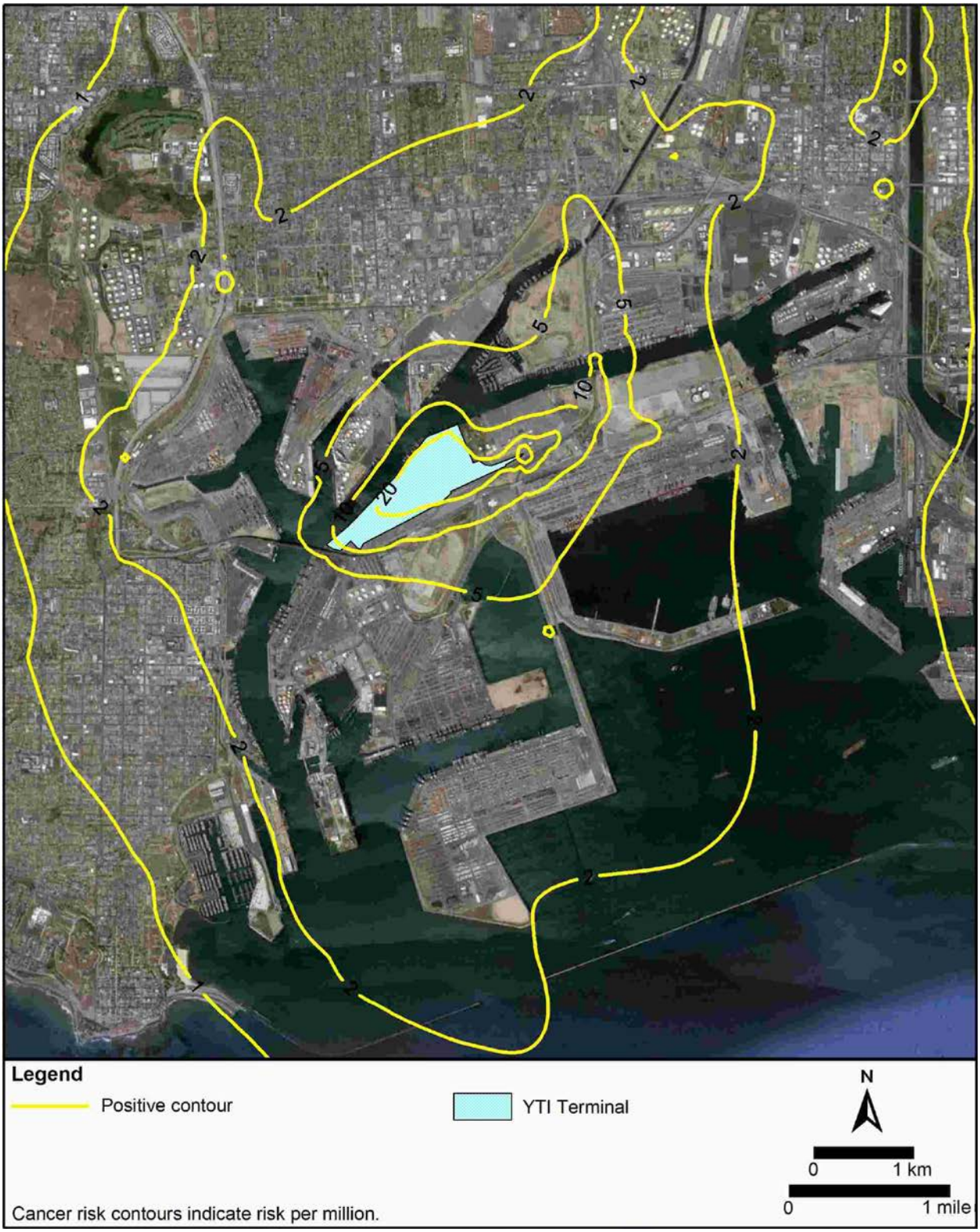


Figure 7-6. Isopleths of Residential Lifetime Cancer Risk: Absolute Proposed Project without Mitigation

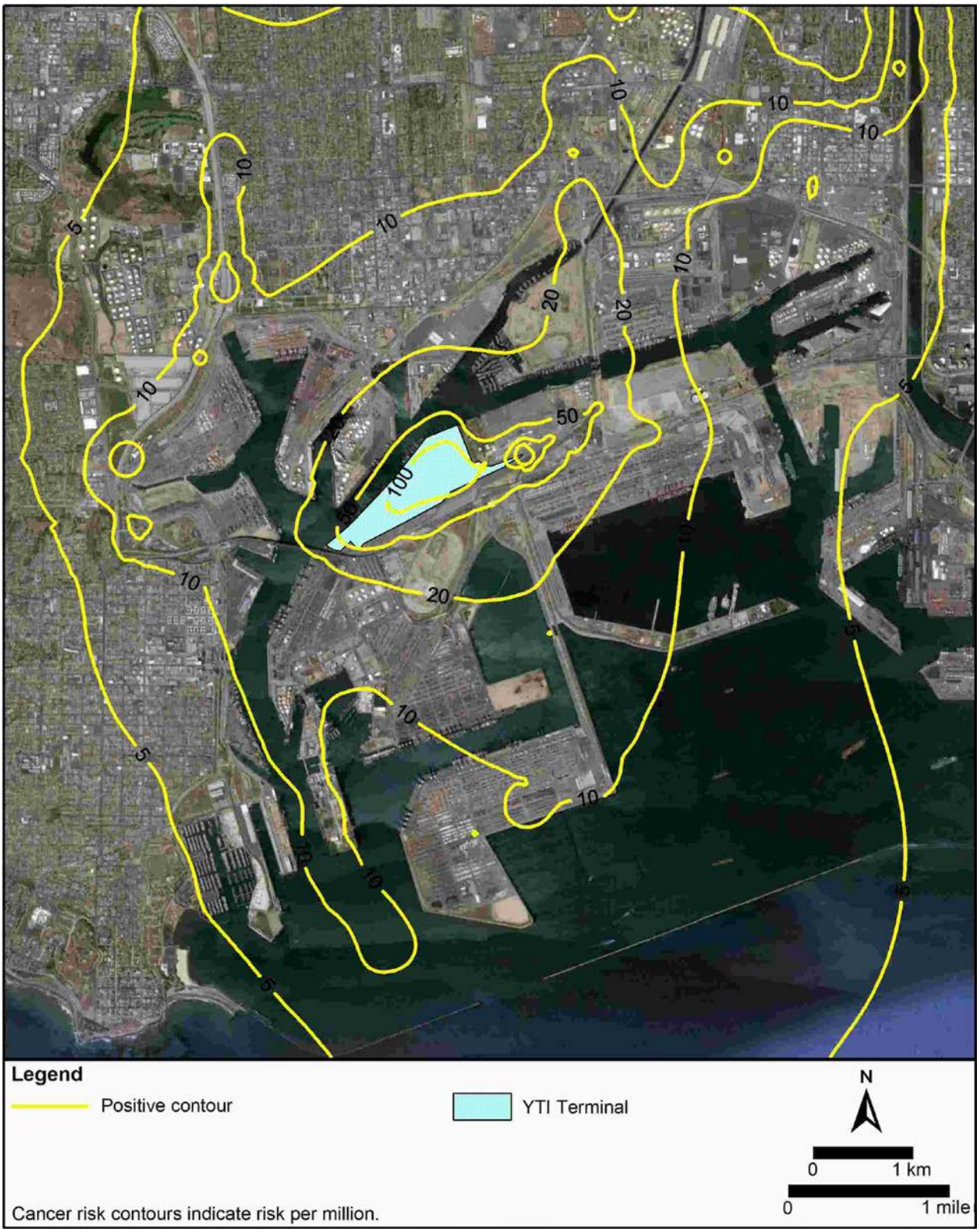


Figure 7-7. Isopleths of Occupational Lifetime Cancer Risk: Absolute Proposed Project without Mitigation

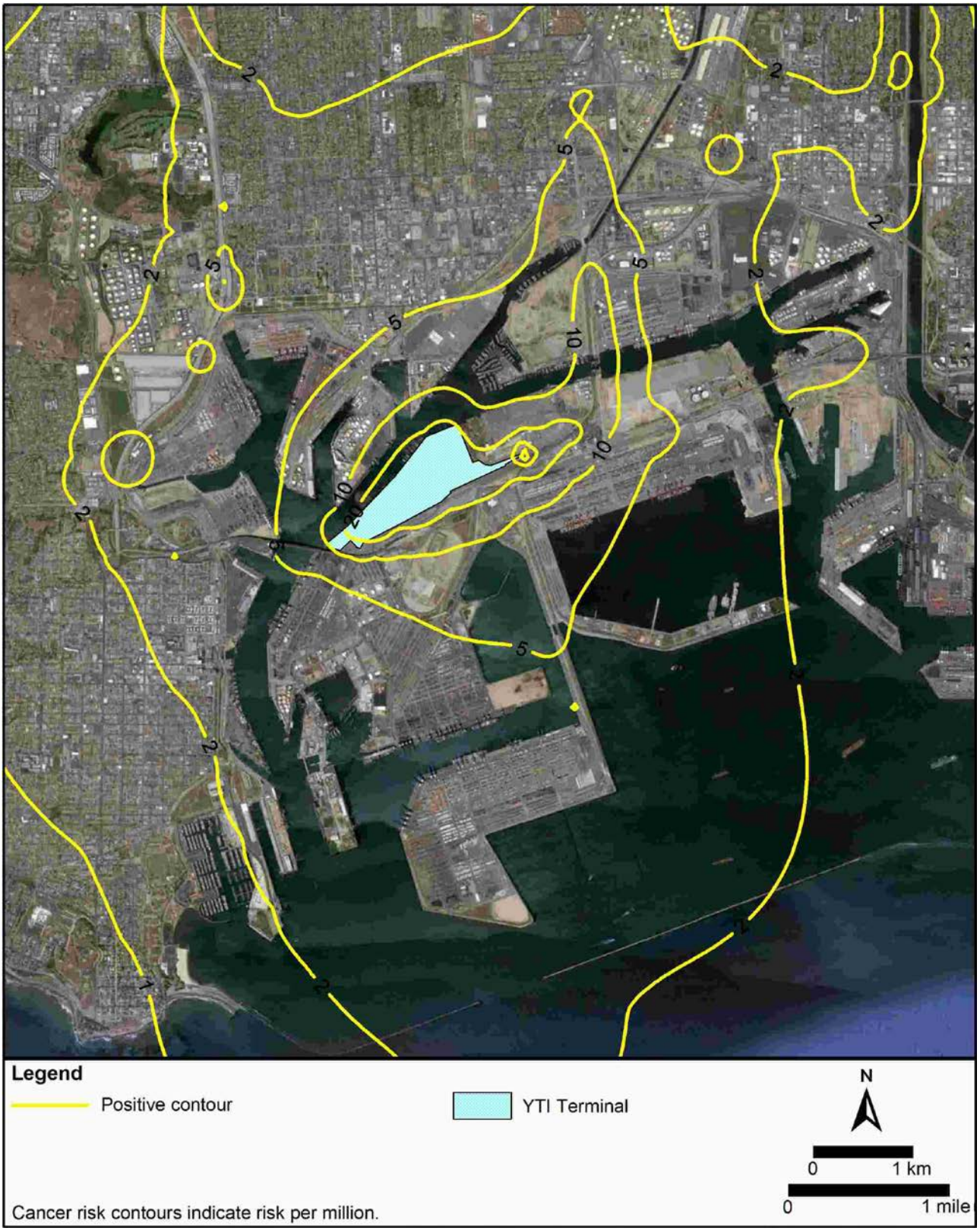


Figure 7-8. Isopleths of Residential Lifetime Cancer Risk: Proposed Project without Mitigation Minus NOP CEQA Baseline

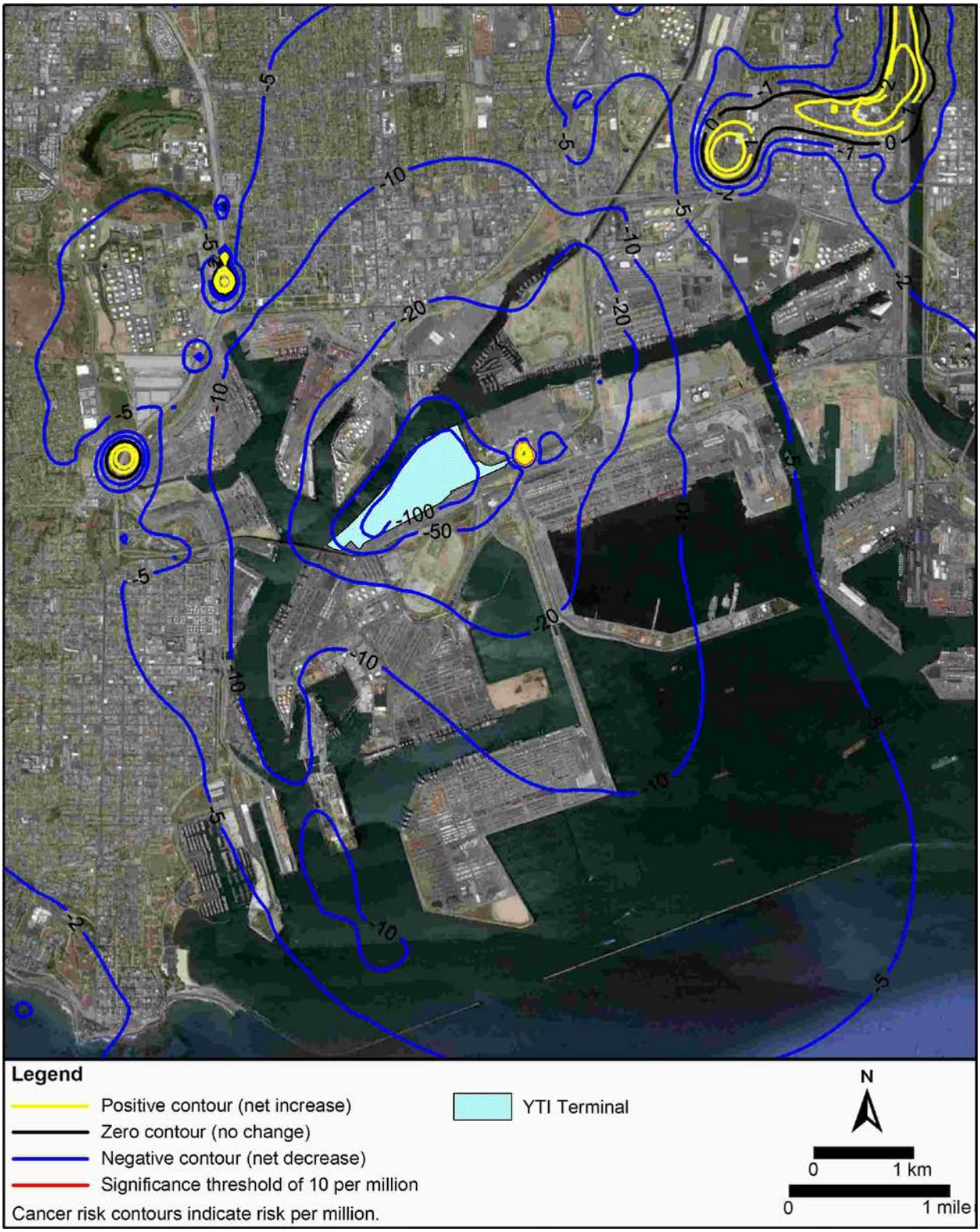


Figure 7-9. Isopleths of Occupational Lifetime Cancer Risk: Proposed Project without Mitigation Minus NOP CEQA Baseline

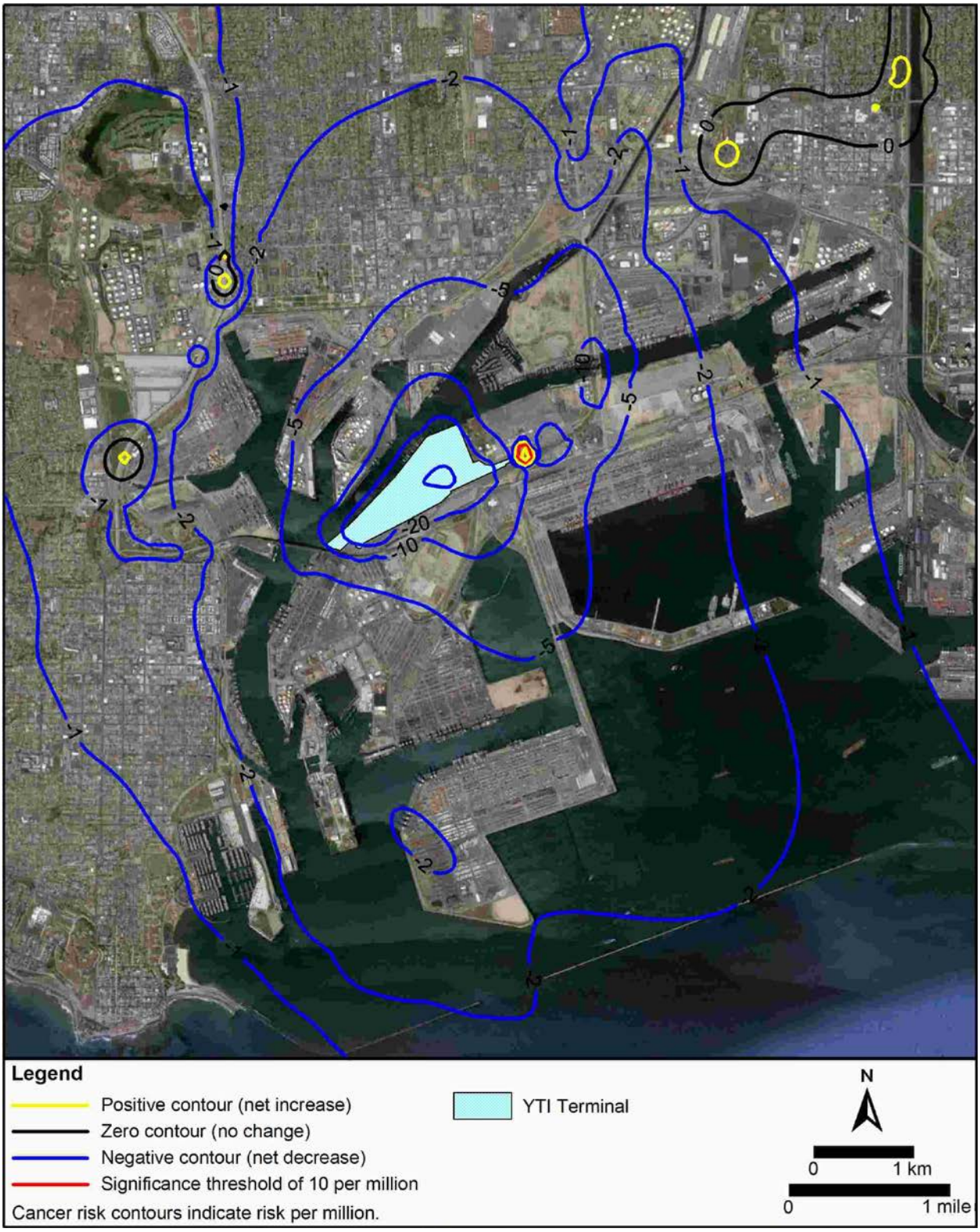


Figure 7-10. Isopleths of Residential Lifetime Cancer Risk: Proposed Project without Mitigation Minus Future CEQA Baseline

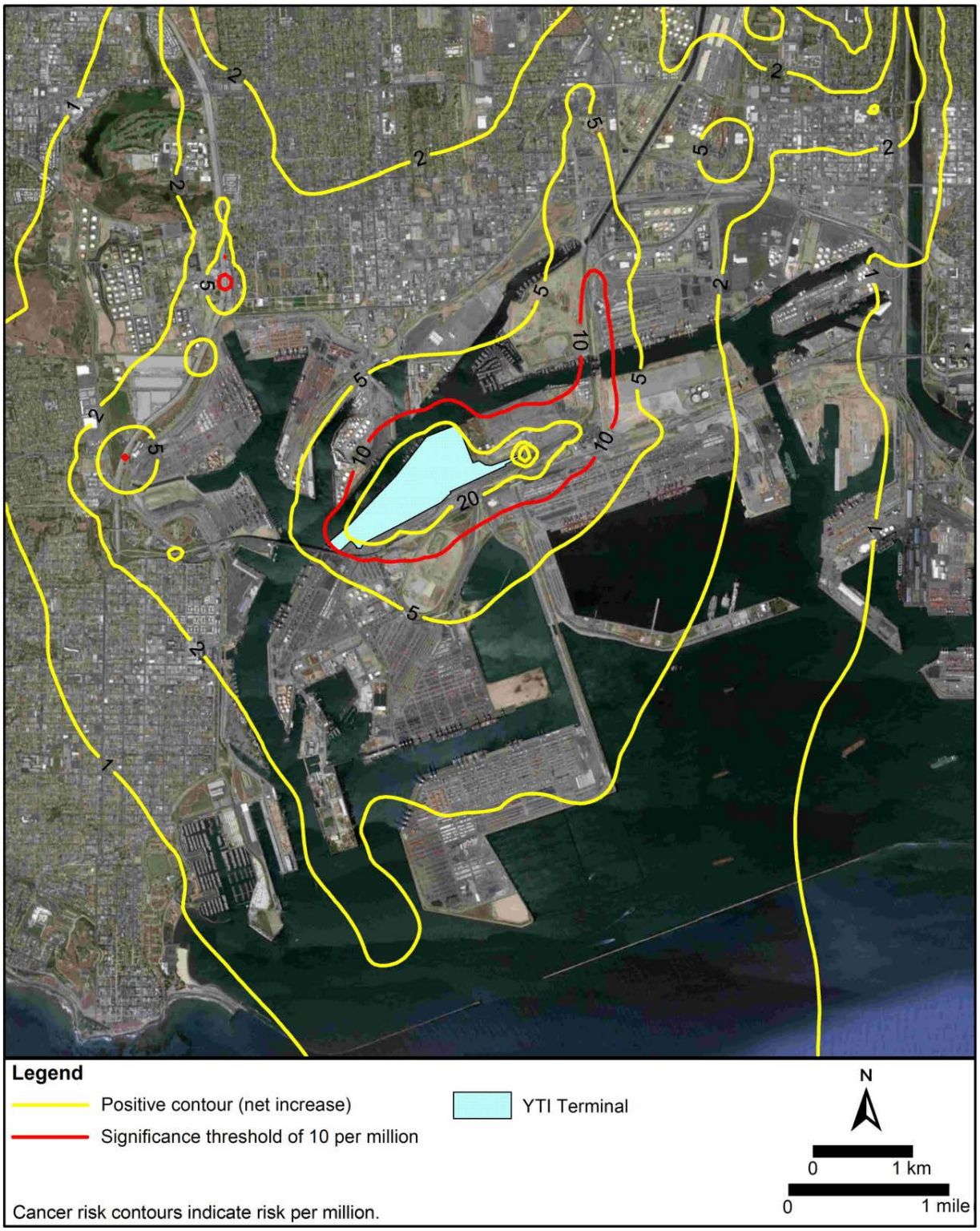
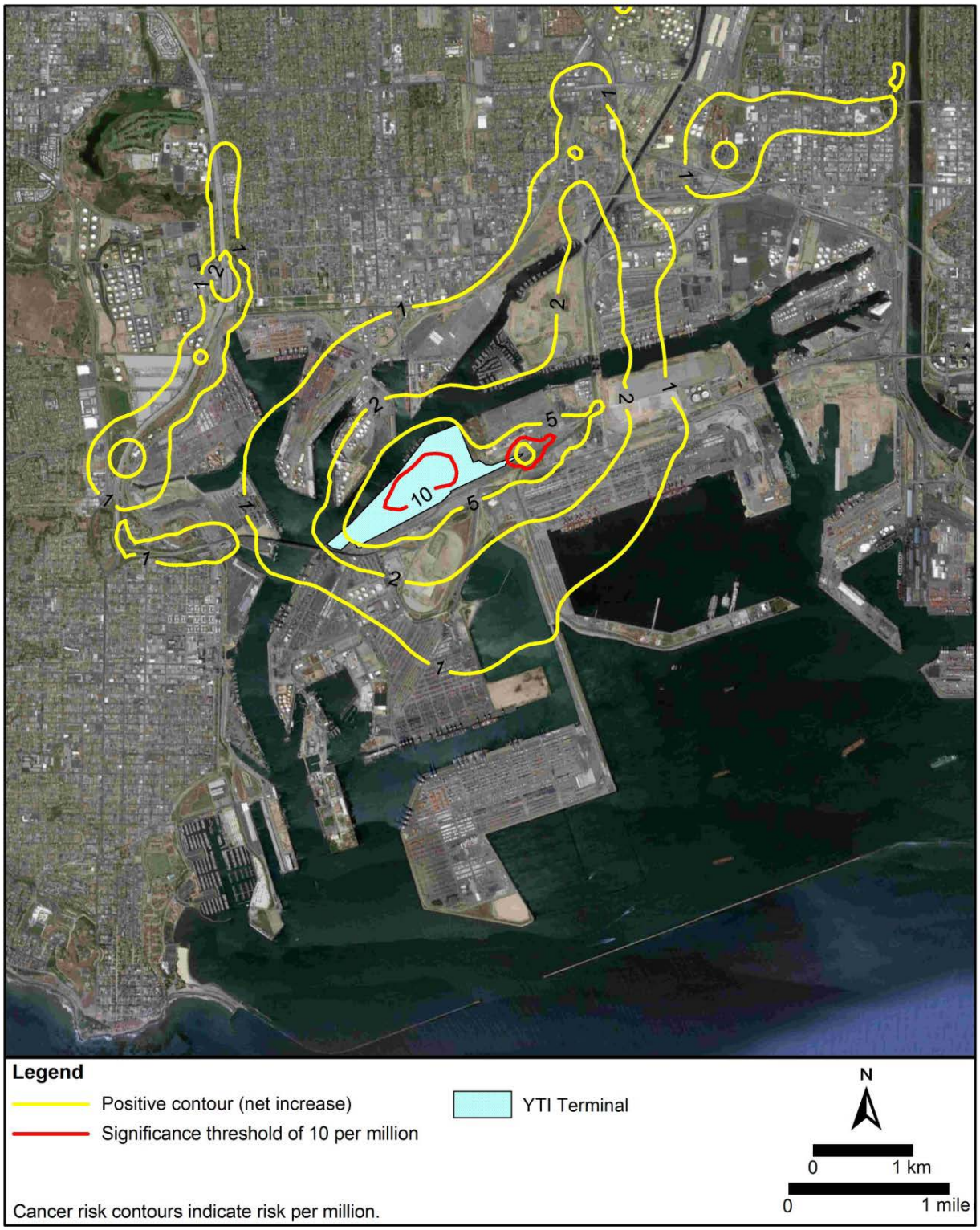


Figure 7-11. Isopleths of Occupational Lifetime Cancer Risk: Proposed Project without Mitigation Minus Future CEQA Baseline



7.1.1.2 NEPA Incremental Impacts

Table 7-3 presents the maximum NEPA health impacts associated with the proposed Project without mitigation. The results for cancer risk and noncancer effects include the maximum impact from the proposed Project alone (prior to subtracting baseline), the maximum impact from the NEPA baseline, and the maximum NEPA increment (Project minus NEPA baseline). The results for cancer burden include the estimated additional number of cancer cases associated with the proposed Project relative to the NEPA baseline (NEPA increment). The table shows the following:

- Cancer Risk - The maximum incremental cancer risk is predicted to be less than the significance threshold at all receptor types.
- Cancer burden – The cancer burden NEPA increment is predicted to be less than the significance threshold.
- The maximum chronic hazard index is predicted to be less than the significance threshold at all receptor types.
- The maximum acute hazard index is predicted to be less than the significance threshold at all receptor types.

A table showing the percent contribution to the NEPA increment is not included because all impacts under NEPA would be below significance thresholds.

Figure 7-12 shows the MEI locations for cancer, chronic non-cancer, and acute non-cancer incremental impacts.

Figure 7-13 and Figure 7-14 show the cancer risk isopleths for the NEPA baseline for residential and occupational receptors, respectively. Figure 7-15 and Figure 7-16 show the unmitigated NEPA increment for residential and occupational receptors, respectively.

Table 7-3. Maximum Incremental NEPA Health Impacts Associated With the Proposed Project Without Mitigation

Health Impact	Receptor Type	Maximum Predicted Impact			Significance Threshold
		Proposed Project	NEPA Baseline	NEPA Increment	
Cancer Risk	Residential - on Land	23 × 10-6 23 in a million	21 × 10-6 21 in a million	3 × 10-6 3 in a million	10 × 10-6 10 in a million
	Residential - in Marina	37 × 10-6 37 in a million	33 × 10-6 33 in a million	4 × 10-6 4 in a million	
	Occupational	94 × 10-6 94 in a million	85 × 10-6 85 in a million	9 × 10-6 9 in a million	
	Sensitive	10 × 10-6 10 in a million	9 × 10-6 9 in a million	1 × 10-6 1 in a million	
	Student	0.7 × 10-6 0.7 in a million	0.5 × 10-6 0.5 in a million	0.2 × 10-6 0.2 in a million	
	Recreational	17 × 10-6	15 × 10-6	2 × 10-6	

Health Impact	Receptor Type	Maximum Predicted Impact			Significance Threshold
		Proposed Project	NEPA Baseline	NEPA Increment	
		17 in a million	15 in a million	2 in a million	
Chronic Hazard Index	Residential - on Land	0.09	0.08	0.007	1
	Residential - in Marina	0.1	0.1	0.004	
	Occupational	0.6	0.5	0.2	
	Sensitive	0.08	0.07	0.005	
	Student	0.08	0.07	0.006	
	Recreational	0.1	0.1	0.01	
Acute Hazard Index	Residential - on Land	0.5	0.4	0.1	1
	Residential - in Marina	0.7	0.6	0.3	
	Occupational	1.1	1.0	0.6	
	Sensitive	0.5	0.4	0.1	
	Student	0.4	0.3	0.1	
	Recreational	0.7	0.6	0.3	
Cancer Burden				NEPA Increment	0.5
				0.04	

Notes:

1. The NEPA increment represents the Project minus NEPA baseline.
2. Each result shown in the table represents the modeled receptor location with the maximum impact or increment. The impacts or increments at all other receptors would be less than the values in the table.
3. The displayed values for the Project and baseline impacts do not necessarily subtract to equal the displayed NEPA increment because they may occur at different receptor locations.
4. Construction emissions were modeled with the operational emissions for the determination of health impacts.
5. An increment less than zero means the Project impact would be less than the baseline impact at all modeled receptors.

Figure 7-12. MEI Locations for NEPA Health Increments – Proposed Project without Mitigation

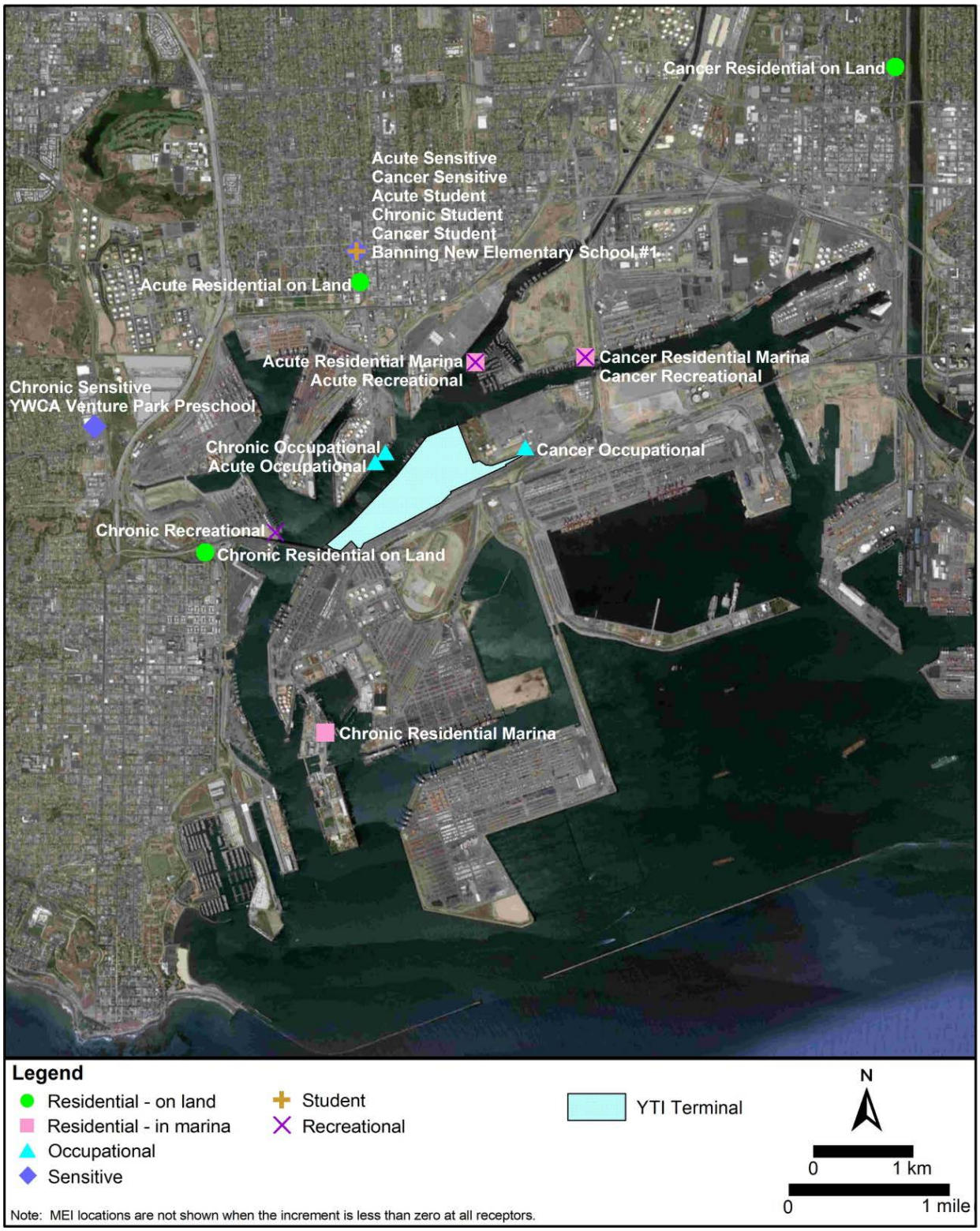


Figure 7-13. Isopleths of Residential Lifetime Cancer Risk: NEPA Baseline

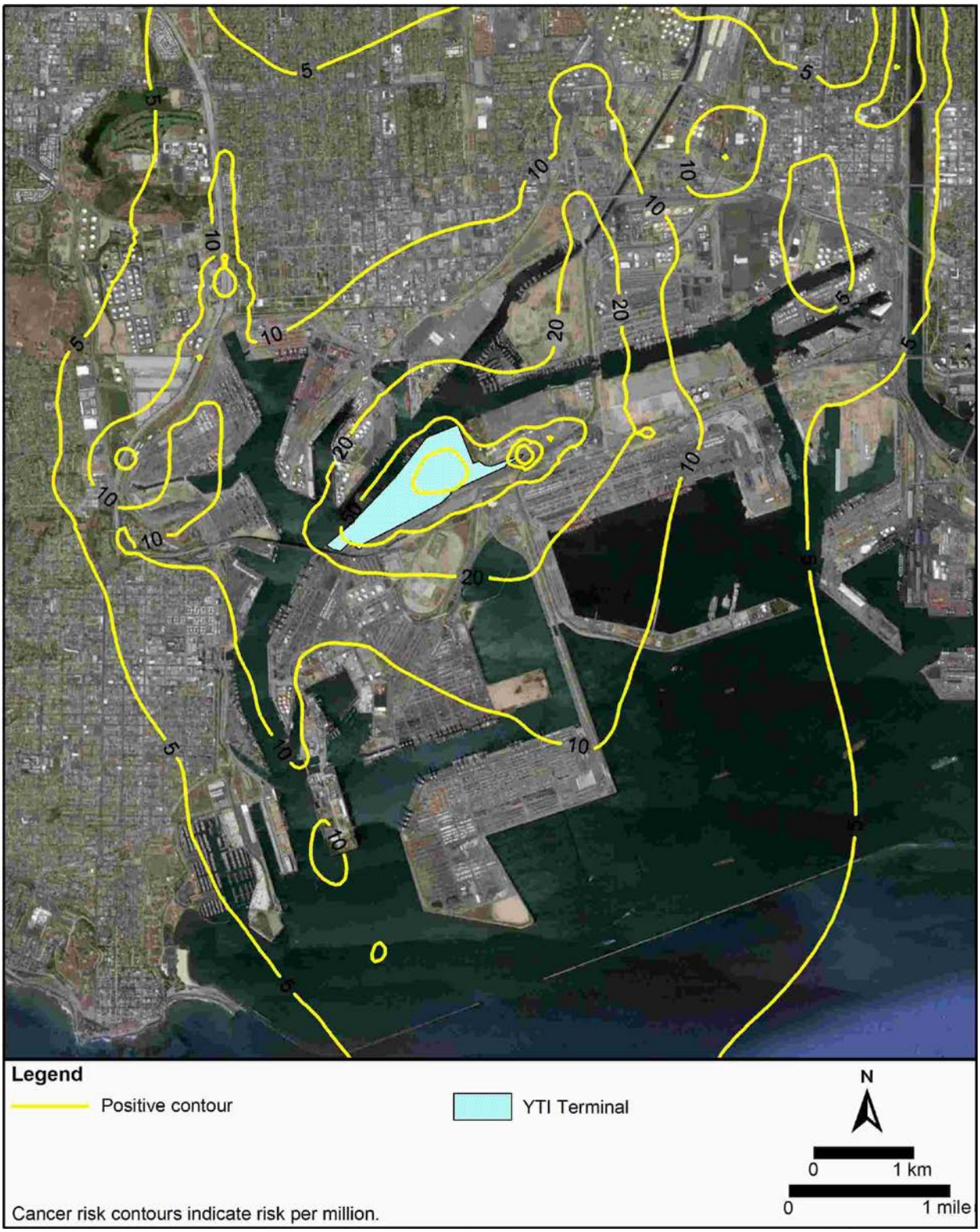


Figure 7-14. Isopleths of Occupational Lifetime Cancer Risk: NEPA Baseline

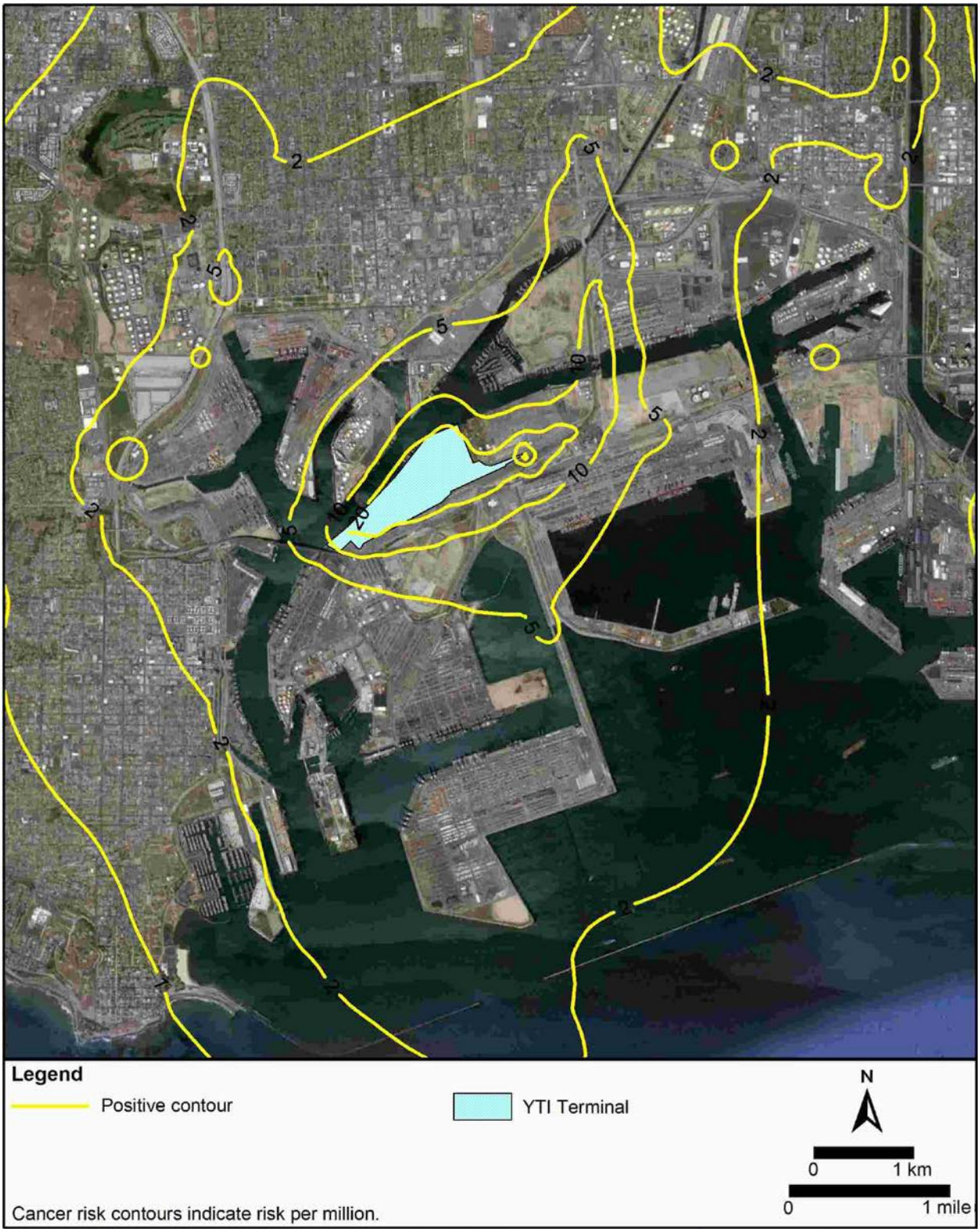


Figure 7-15. Isopleths of Residential Lifetime Cancer Risk: Proposed Project without Mitigation Minus NEPA Baseline

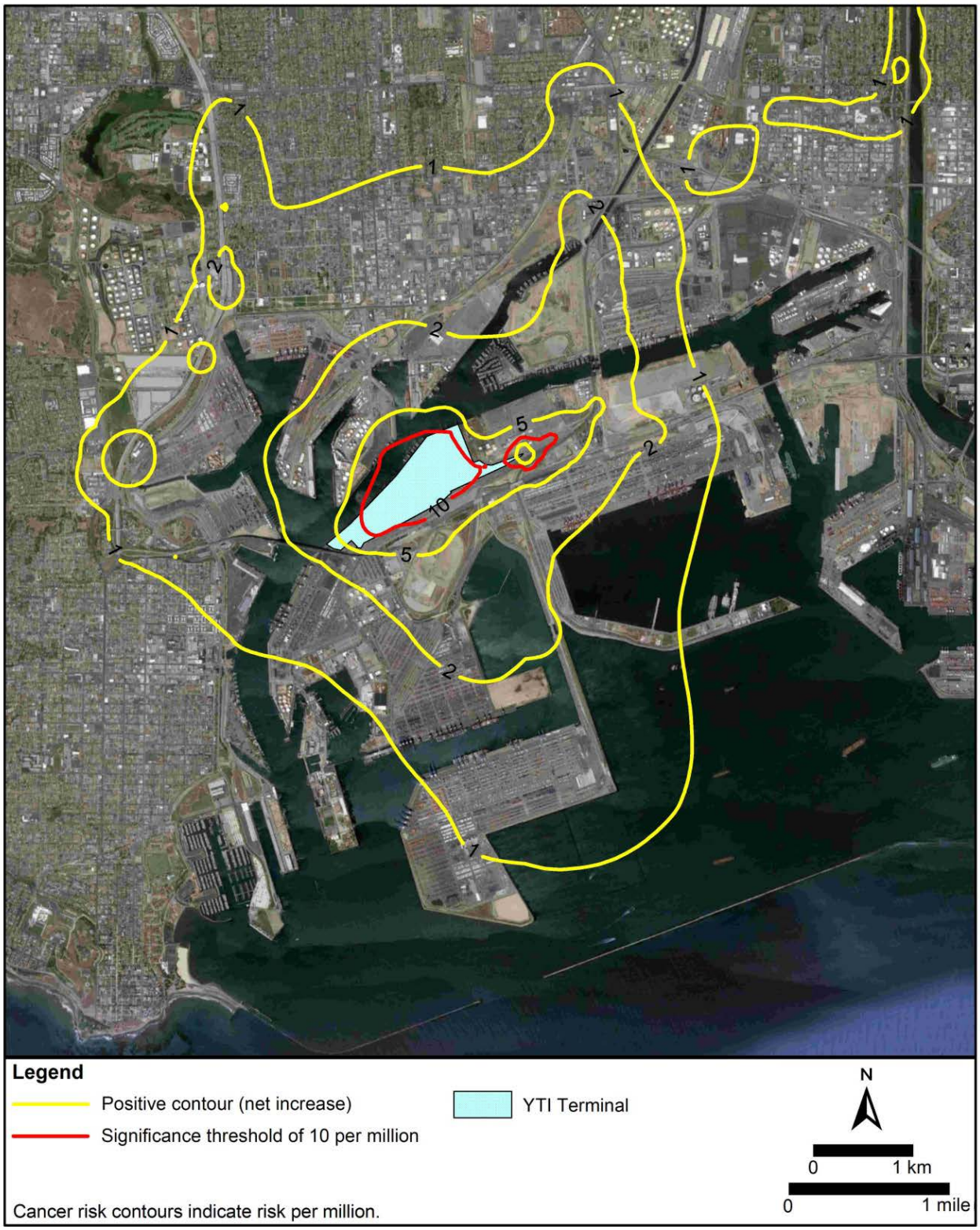
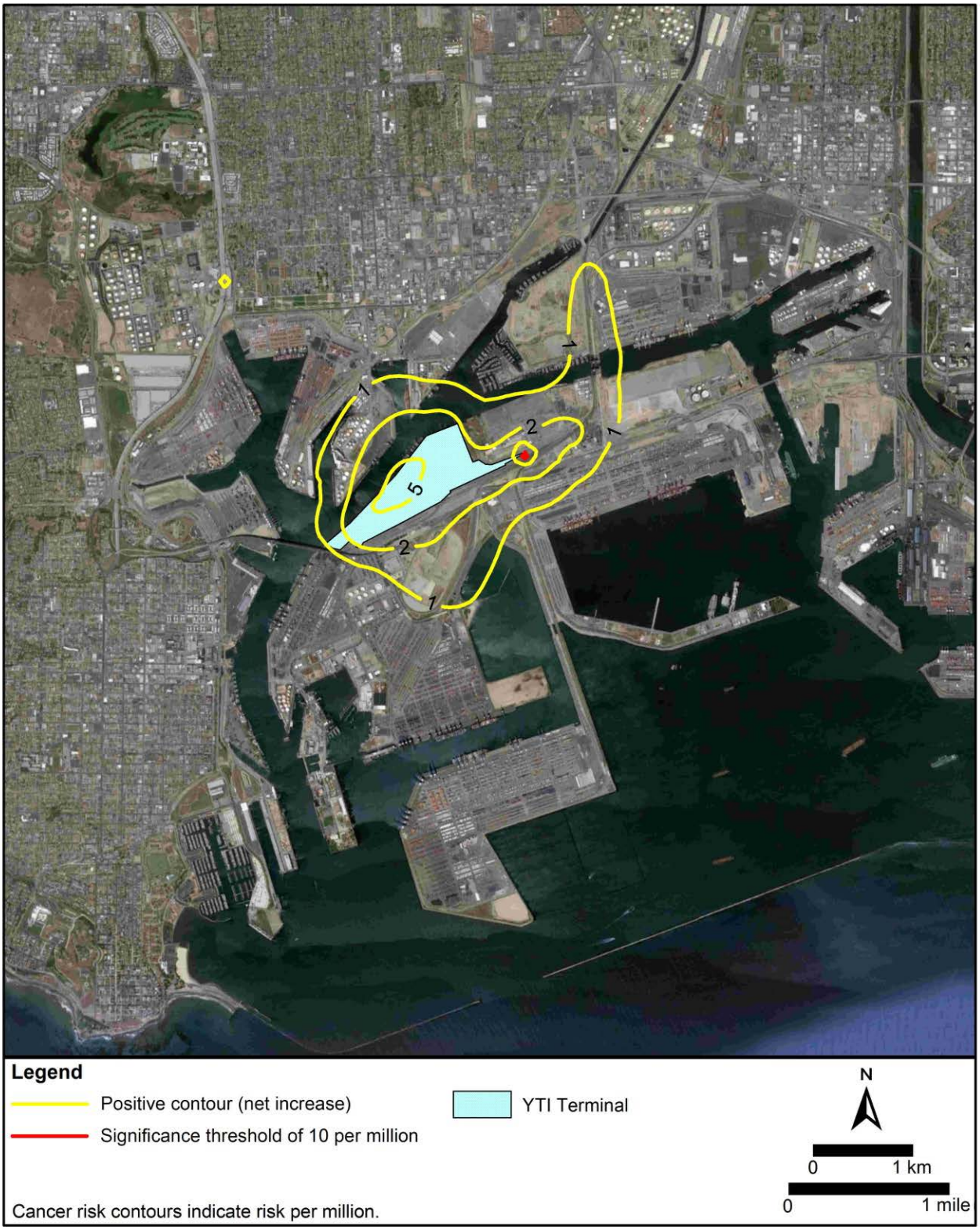


Figure 7-16. Isopleths of Occupational Lifetime Cancer Risk: Proposed Project without Mitigation Minus NEPA Baseline



7.1.2 Mitigated Impacts

7.1.2.1 CEQA Incremental Impacts

Table 7-4 presents the maximum CEQA health impacts associated with the mitigated proposed Project. The table shows that in relation to the NOP CEQA baseline, cancer risk would not change appreciably from the unmitigated scenario because cancer risk would be driven by truck exhaust, for which mitigation beyond the Clean Truck Program is not feasible. The table also shows that in relation to the Future CEQA baseline, cancer risk would not change appreciably from the unmitigated scenario because cancer risk would be driven by locomotive and truck exhaust, for which project-level mitigation not feasible. EIS/EIR Section 3.2.4 contains a detailed discussion of mitigation measures.

Table 7-5 shows the percent contribution to cancer risk for the NOP and Future CEQA increments for each modeled source group associated with residential and offsite occupational exposure. The NOP and Future CEQA increments would be less than 1 for non-cancer chronic and acute impacts and are therefore not presented in the table.

Figure 7-17 shows the MEI locations for cancer, chronic non-cancer, and acute non-cancer incremental impacts, following mitigation.

Figure 7-18 through Figure 7-23 show isopleths of the mitigated absolute proposed Project cancer risks for residential and occupational receptors, the mitigated NOP CEQA cancer risk increments for residential and occupational receptors, and the mitigated Future CEQA cancer risk increments for residential and occupational receptors, respectively.

Table 7-4. Maximum Incremental CEQA Health Impacts Associated with the Proposed Project with Mitigation

Health Impact	Receptor Type	Maximum Predicted Impact					Significance Threshold
		Proposed Project	**NOP CEQA Baseline**	**NOP CEQA Increment**	**Future CEQA Baseline**	**Future CEQA Increment**	
Cancer Risk	Residential - on Land	23 × 10-6 23 in a million	26 × 10-6 26 in a million	5 × 10-6 5 in a million	19 × 10-6 19 in a million	6 × 10-6 6 in a million	10 × 10-6 10 in a million
	Residential - in Marina	36 × 10-6 36 in a million	85 × 10-6 85 in a million	<0	25 × 10-6 25 in a million	**11 × 10-6** **11 in a million**	
	Occupational	94 × 10-6 94 in a million	75 × 10-6 75 in a million	**19 × 10-6** **19 in a million**	63 × 10-6 63 in a million	**31 × 10-6** **31 in a million**	
	Sensitive	10 × 10-6 10 in a million	23 × 10-6 23 in a million	<0	8 × 10-6 8 in a million	3 × 10-6 3 in a million	
	Student	0.6 × 10-6 0.6 in a million	0.7 × 10-6 0.7 in a million	0.05 × 10-6 0.05 in a million	0.7 × 10-6 0.7 in a million	0.05 × 10-6 0.05 in a million	
	Recreational	16 × 10-6 16 in a million	39 × 10-6 39 in a million	2 × 10-6 2 in a million	12 × 10-6 12 in a million	5 × 10-6 5 in a million	
Chronic Hazard Index		**Proposed Project**	**NOP CEQA Baseline** [3]	**NOP CEQA Increment** [3]			1
	Residential - on Land	0.08	0.1	<0			

Health Impact	Receptor Type	Maximum Predicted Impact					Significance Threshold
		Proposed Project	NOP CEQA Baseline	NOP CEQA Increment	Future CEQA Baseline	Future CEQA Increment	
	Residential - in Marina	0.1	0.2	<0			
	Occupational	0.6	0.4	0.2			
	Sensitive	0.07	0.1	<0			
	Student	0.07	0.1	<0			
	Recreational	0.1	0.2	0.003			
Acute Hazard Index	Residential - on Land	0.5	0.4	0.1			1
	Residential - in Marina	0.6	0.6	0.2			
	Occupational	1.1	0.9	0.4			
	Sensitive	0.4	0.3	0.1			
	Student	0.3	0.3	0.1			
	Recreational	0.6	0.6	0.2			
Cancer Burden				NOP CEQA Increment	Future CEQA Increment		0.5
				0.002	0.13		

Notes:

1. Exceedances of the significance thresholds are in bold. The significance thresholds apply only to the increments.
2. The NOP CEQA increment represents the Project minus NOP CEQA baseline. The Future CEQA increment represents the Project minus Future CEQA baseline. The Future CEQA baseline and Future CEQA increments are only applicable to cancer risk because cancer risk is based on long-term (multiple-year) exposure periods.
3. Chronic and acute impacts are considered short-term impacts and are determined by comparing project-related impacts to the NOP CEQA baseline, the baseline at the time of the NOP in 2012.
4. Each result shown in the table represents the modeled receptor location with the maximum impact or increment. The impacts or increments at all other receptors would be less than the values in the table.
5. The displayed values for the Project and baseline impacts do not necessarily subtract to equal the displayed CEQA increments because they may occur at different receptor locations.
6. Construction emissions were modeled with the operational emissions for the determination of health impacts.
7. An increment less than zero means the Project impact would be less than the baseline impact at all modeled receptors.

Table 7-5. Source Contributions to Cancer Risk at the CEQA Increment MEIs – Proposed Project with Mitigation

Source Category	Cancer Risk MEI Receptor			
	Residential NOP CEQA Increment	Residential Future CEQA Increment	Occupational NOP CEQA Increment	Occupational Future CEQA Increment
Container Ships - Anchorage	0.2%	0.2%	0.0%	0.0%
Container Ships - Hoteling	1.3%	2.8%	0.6%	0.6%
Container Ships - Transit	3.1%	4.1%	0.6%	0.6%
Container Ships - Total	4.6%	7.1%	1.2%	1.2%
Assist Tugboats	0.2%	0.4%	0.1%	0.1%

Source Category	Cancer Risk MEI Receptor			
	Residential NOP CEQA Increment	Residential Future CEQA Increment	Occupational NOP CEQA Increment	Occupational Future CEQA Increment
Locomotives	2.0%	65.7%	13.4%	13.4%
Container Trucks - Off Site	92.0%	22.0%	80.3%	80.3%
Container Trucks - On Site	0.3%	1.6%	2.8%	2.8%
Container Trucks - Total	92.3%	23.6%	83.1%	83.1%
Cargo Handling Equipment	0.8%	2.8%	1.2%	1.2%
Construction Activity	0.0%	0.0%	0.0%	0.0%
Transport Refrigeration Units	0.0%	0.1%	0.1%	0.1%
Worker Trips	0.1%	0.3%	0.9%	0.9%
Note: Contributions are from proposed Project sources prior to subtracting baseline.				

Figure 7-17. MEI Locations for CEQA Health Increments – Proposed Project with Mitigation

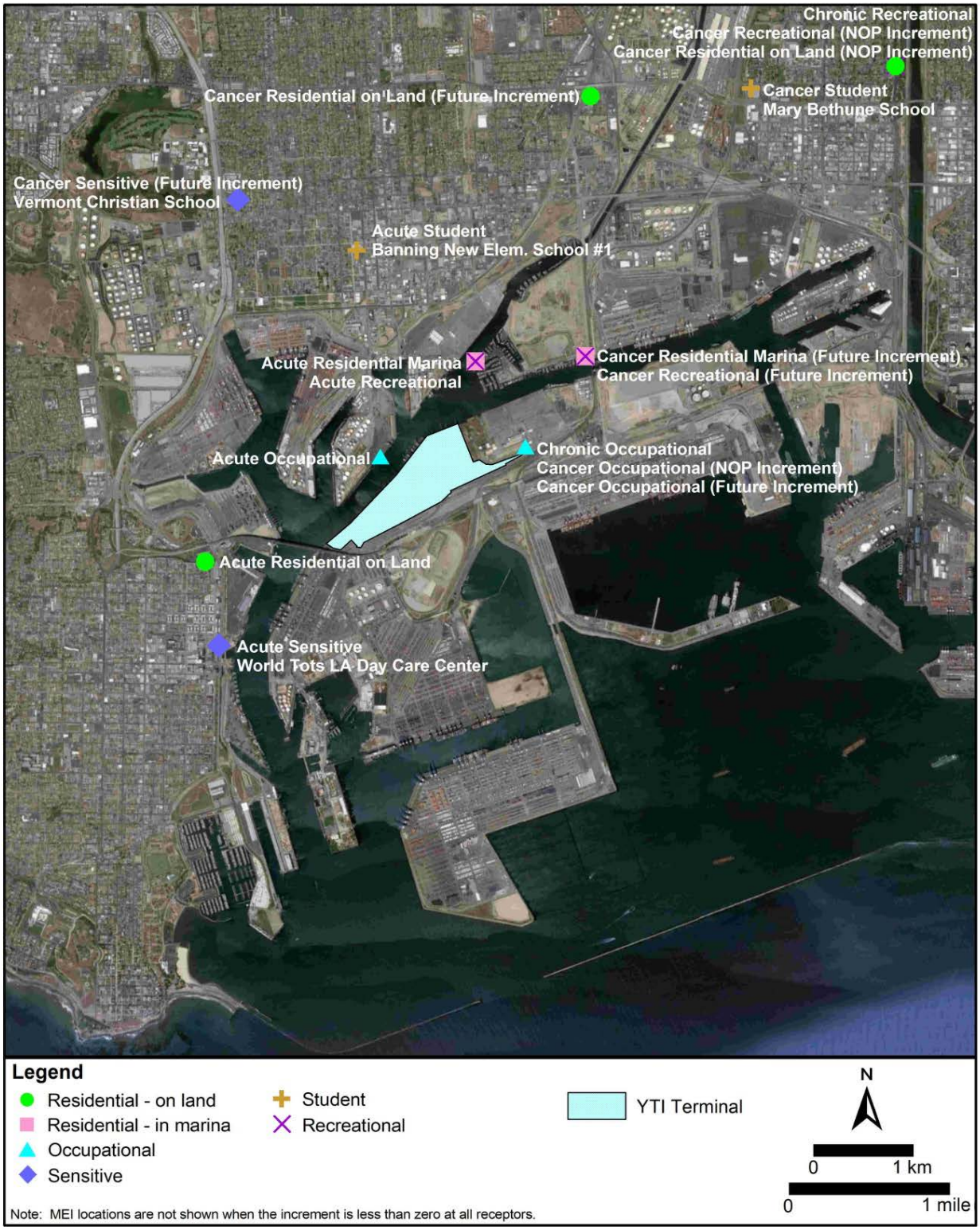


Figure 7-18. Isopleths of Residential Lifetime Cancer Risk: Absolute Proposed Project with Mitigation

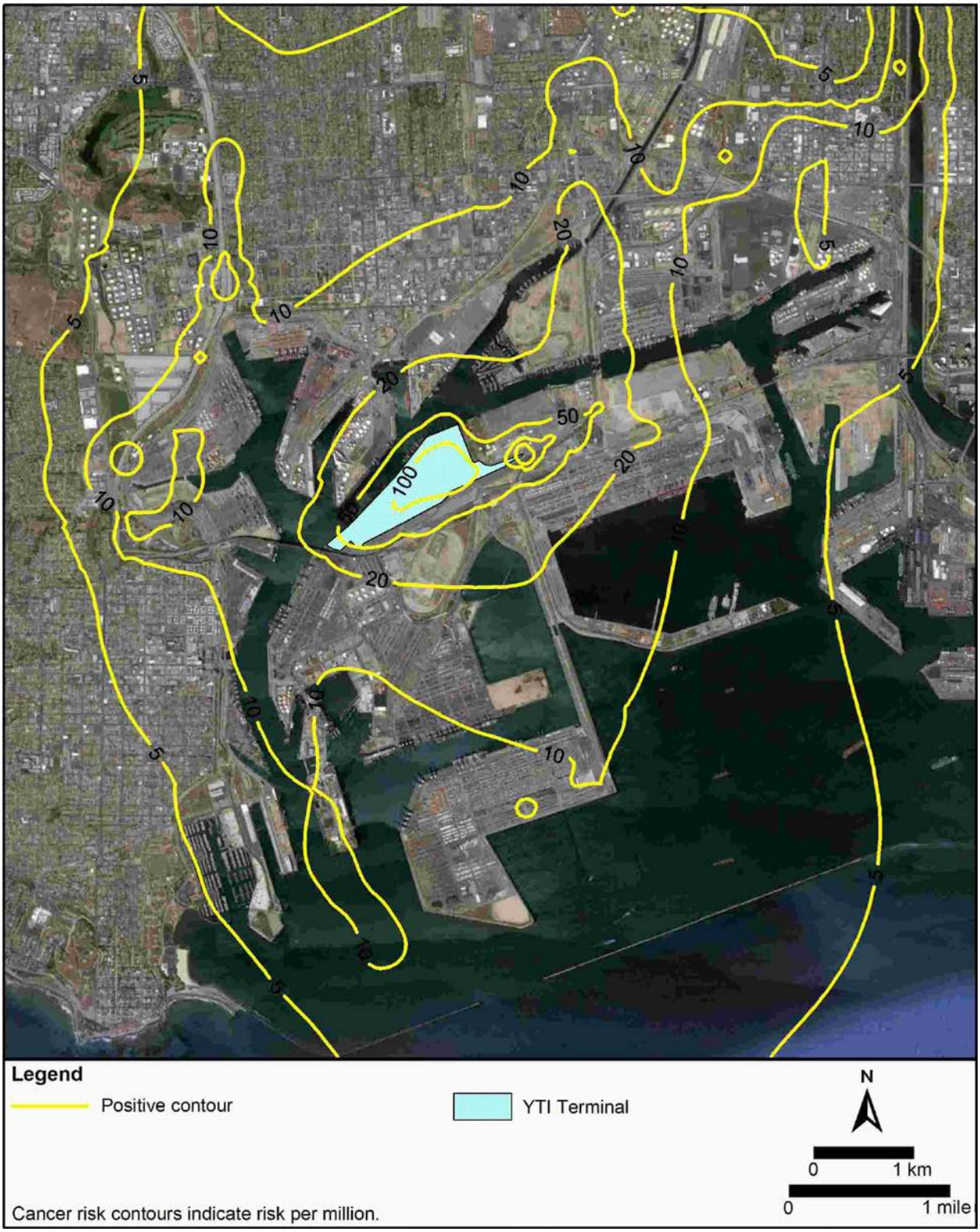


Figure 7-19. Isopleths of Occupational Lifetime Cancer Risk: Absolute Proposed Project with Mitigation

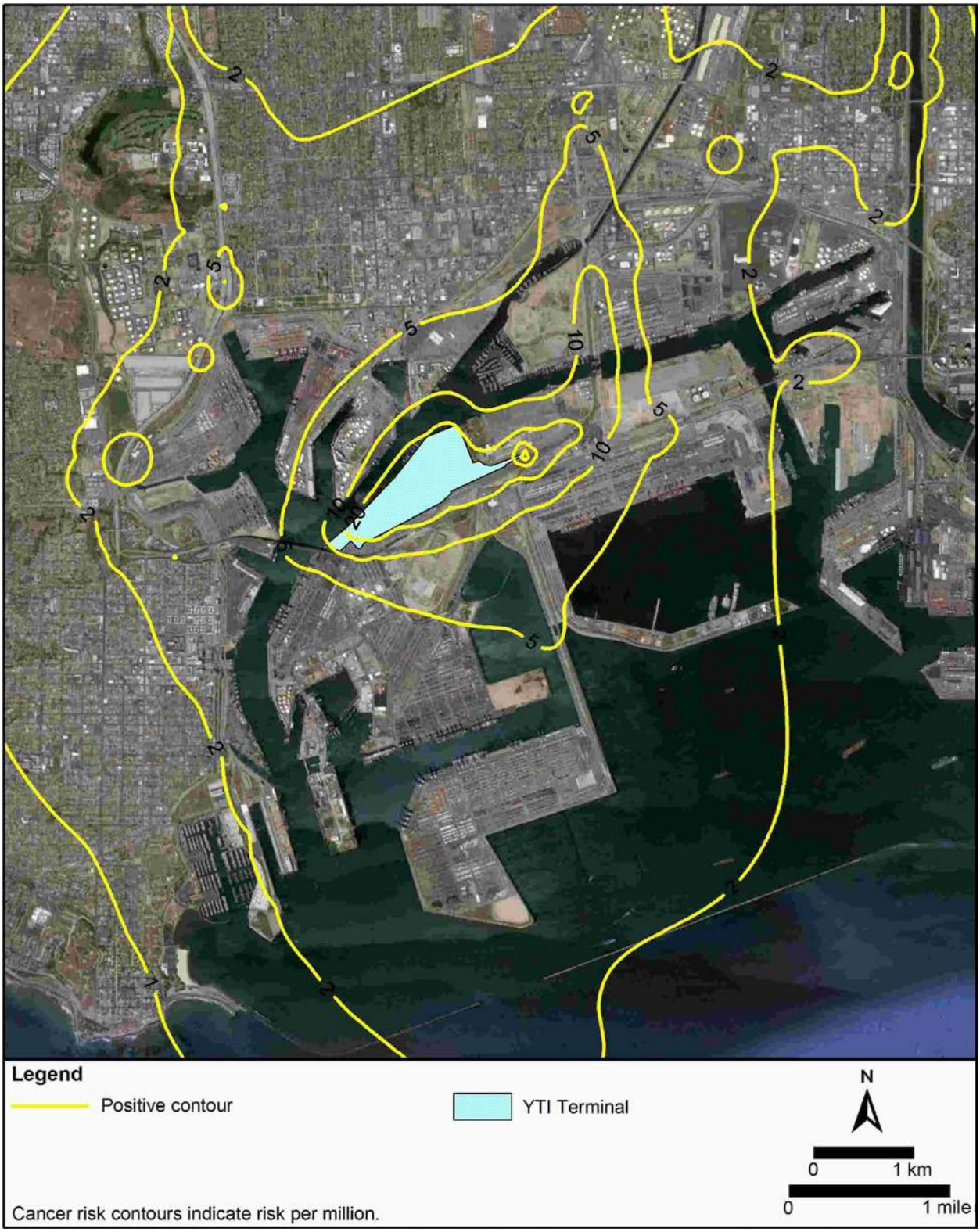


Figure 7-20. Isopleths of Residential Lifetime Cancer Risk: Proposed Project with Mitigation Minus NOP CEQA Baseline

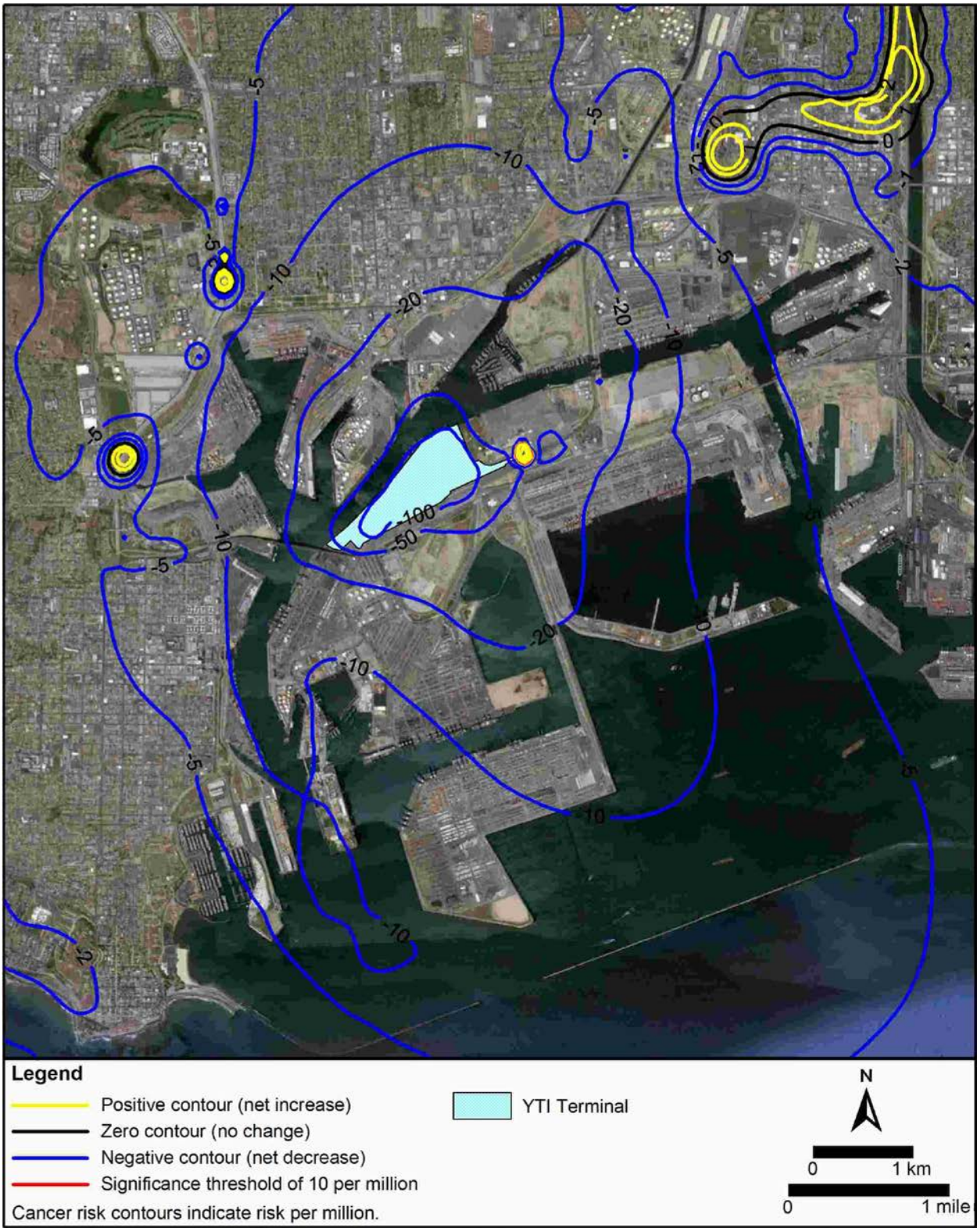


Figure 7-21. Isopleths of Occupational Lifetime Cancer Risk: Proposed Project with Mitigation Minus NOP CEQA Baseline

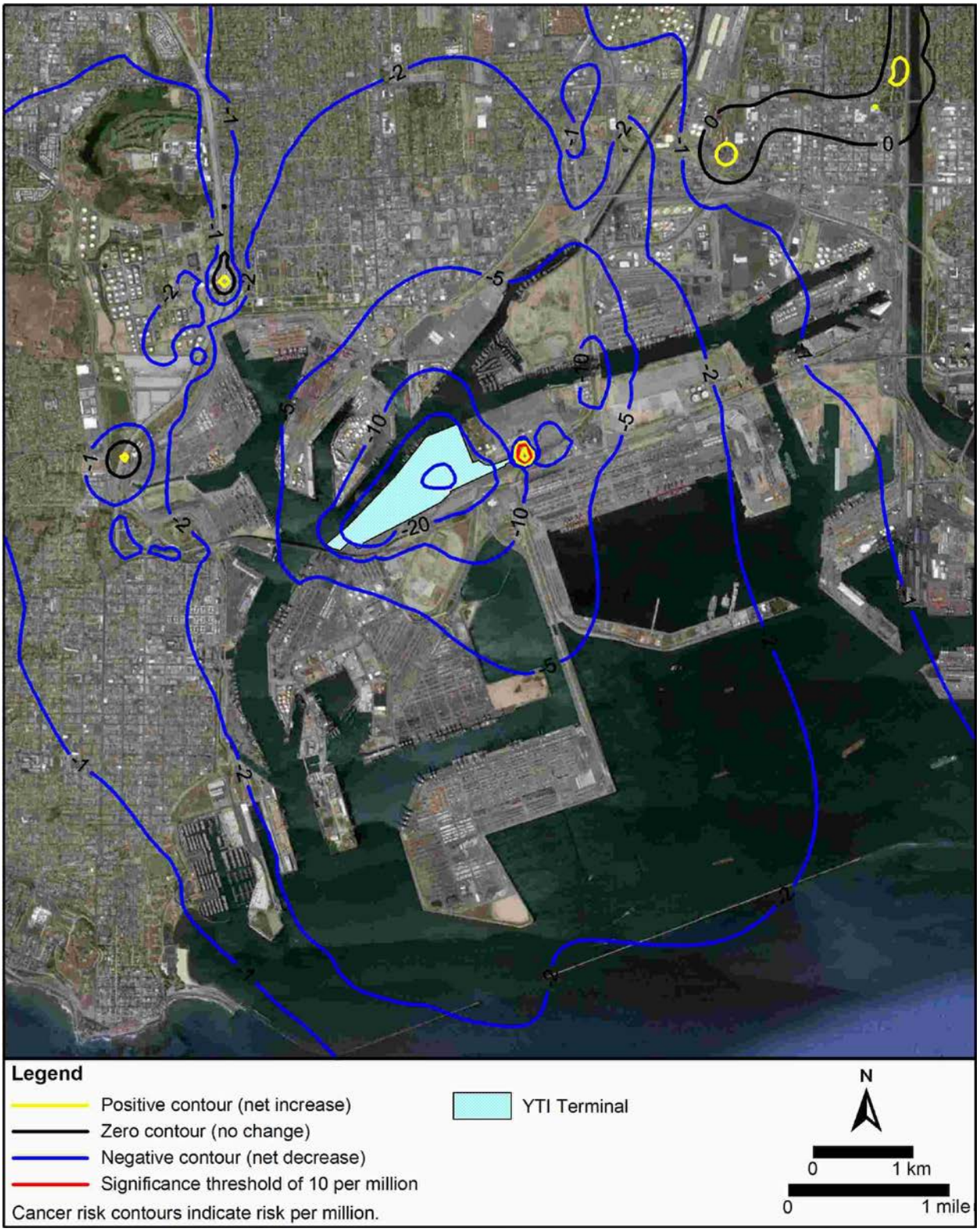


Figure 7-22. Isopleths of Residential Lifetime Cancer Risk: Proposed Project with Mitigation Minus Future CEQA Baseline

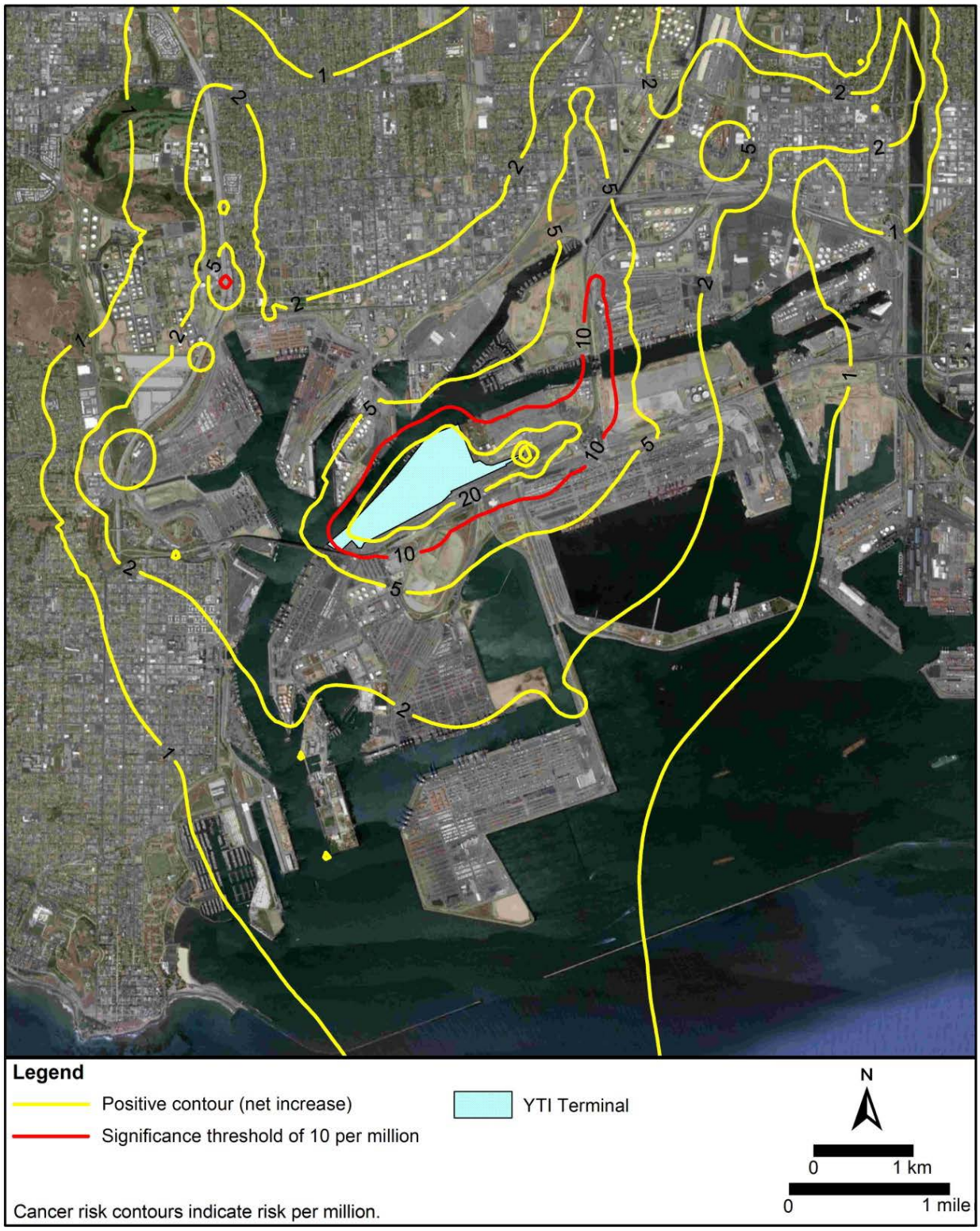


Figure 7-23. Isopleths of Occupational Lifetime Cancer Risk: Proposed Project with Mitigation Minus Future CEQA Baseline

7.1.2.2 NEPA Incremental Impacts

Tables showing NEPA impacts following mitigation are not presented; mitigation is not required since unmitigated impacts would be less than significance thresholds.

7.2 Alternatives

7.2.1 Unmitigated Impacts

7.2.1.1 Alternative 1

Table 7-6 presents the maximum CEQA health impacts associated with Alternative 1. The table shows the following:

- Cancer Risk
  - In relation to the NOP CEQA baseline, the maximum incremental cancer risk is predicted to be less than the significance threshold at all receptor types except the occupational receptor. Cancer risk at the occupational receptor would equal the significance threshold.
  - In relation to the Future CEQA baseline, the maximum incremental cancer risk is predicted to be less than the significance threshold at all receptor types except the occupational receptor. Cancer risk at the occupational receptor would exceed the significance threshold.
- Cancer burden and non-cancer chronic and acute impacts would be below significance thresholds.
- Particulates: Morbidity and Mortality: Operation of Alternative 1 would result in a maximum off-site 24-hour $PM_{2.5}$ concentration increment that would not exceed the SCAQMD significance threshold of 2.5 µg/m3 (see EIR/EIS Section 3.2.4). Because the operational $PM_{2.5}$ concentrations would be less than significant and would not exceed the Port's criterion for calculating morbidity and mortality attributable to PM, potential mortality and morbidity effects were not quantified for this Alternative.
- NEPA does not require analysis of Alternative 1, the No Project Alternative.

Figure 7-24 shows the MEI locations for cancer, chronic non-cancer, and acute non-cancer incremental impacts for Alternative 1.

Table 7-6. Maximum Incremental CEQA Health Impacts Associated with Alternative 1, No Project Alternative

Health Impact	Receptor Type	Maximum Predicted Impact					Significance Threshold
		No Project	NOP CEQA Baseline	NOP CEQA Increment	Future CEQA Baseline	Future CEQA Increment	
Cancer Risk	Residential - on Land	21 × 10-6 21 in a million	26 × 10-6 26 in a million	2 × 10-6 2 in a million	19 × 10-6 19 in a million	5 × 10-6 5 in a million	10 × 10-6 10 in a

Health Impact	Receptor Type	Maximum Predicted Impact					Significance Threshold
		No Project	NOP CEQA Baseline	NOP CEQA Increment	Future CEQA Baseline	Future CEQA Increment	
	Residential - in Marina	33 × 10-6 33 in a million	85 × 10-6 85 in a million	<0	25 × 10-6 25 in a million	7 × 10-6 7 in a million	million
	Occupational	85 × 10-6 85 in a million	75 × 10-6 75 in a million	**10 × 10-6** **10 in a million**	63 × 10-6 63 in a million	**22 × 10-6** **22 in a million**	
	Sensitive	9 × 10-6 9 in a million	23 × 10-6 23 in a million	<0	8 × 10-6 8 in a million	2 × 10-6 2 in a million	
	Student	0.5 × 10-6 0.5 in a million	0.7 × 10-6 0.7 in a million	0.03 × 10-6 0.03 in a million	0.7 × 10-6 0.7 in a million	0.03 × 10-6 0.03 in a million	
	Recreational	15 × 10-6 15 in a million	39 × 10-6 39 in a million	1 × 10-6 1 in a million	12 × 10-6 12 in a million	3 × 10-6 3 in a million	
Chronic Hazard Index		**No Project**	**NOP CEQA Baseline** [3]	**NOP CEQA Increment** [3]			1
	Residential - on Land	0.08	0.1	<0			
	Residential - in Marina	0.1	0.2	<0			
	Occupational	0.5	0.4	0.1			
	Sensitive	0.07	0.1	<0			
	Student	0.07	0.1	<0			
	Recreational	0.1	0.2	0.00008			
Acute Hazard Index	Residential - on Land	0.4	0.4	0.05			1
	Residential - in Marina	0.6	0.6	0.06			
	Occupational	0.9	0.9	0.08			
	Sensitive	0.4	0.3	0.05			
	Student	0.3	0.3	0.03			
	Recreational	0.6	0.6	0.06			
Cancer Burden				**NOP CEQA Increment**	**Future CEQA Increment**		0.5
				0.0005	0.07		

Notes:

1. Exceedances of the significance thresholds are in bold. The significance thresholds apply only to the increments.

2. The NOP CEQA increment represents the Project minus NOP CEQA baseline. The Future CEQA increment represents the Project minus Future CEQA baseline. The Future CEQA baseline and Future CEQA increments are only applicable to cancer risk because cancer risk is based on long-term (multiple-year) exposure periods.

3. Chronic and acute impacts are considered short-term impacts and are determined by comparing project-related impacts to the NOP CEQA baseline, the baseline at the time of the NOP in 2012.

4. Each result shown in the table represents the modeled receptor location with the maximum impact or increment. The impacts or increments at all other receptors would be less than the values in the table.

5. The displayed values for the No Project and baseline impacts do not necessarily subtract to equal the displayed CEQA increments because they may occur at different receptor locations.

6. An increment less than zero means the No Project impact would be less than the baseline impact at all modeled receptors.

Figure 7-24. MEI Locations for CEQA Health Increments – Alternative 1, No Project Alternative

7.2.1.2 Alternative 2

Table 7-7 presents the maximum CEQA health impacts associated with Alternative 2 without mitigation. The table shows the following:

- Cancer Risk
  - In relation to the NOP CEQA baseline, the maximum incremental cancer risk is predicted to be less than the significance threshold at all receptor types except the occupational receptor. Cancer risk at the occupational receptor would equal the significance threshold.
  - In relation to the Future CEQA baseline, the maximum incremental cancer risk is predicted to be less than the significance threshold at all receptor types except the occupational receptor. Cancer risk at the occupational receptor would exceed the significance threshold.
- Cancer burden and non-cancer chronic and acute impacts would be below significance thresholds.
- Particulates: Morbidity and Mortality: Operation of Alternative 2 would result in a maximum off-site 24-hour $PM_{2.5}$ concentration increment that would not exceed the SCAQMD significance threshold of 2.5 µg/m3 (see EIR/EIS Section 3.2.4). Because the operational $PM_{2.5}$ concentrations would be less than significant and would not exceed the Port's criterion for calculating morbidity and mortality attributable to PM, potential mortality and morbidity effects were not quantified for this Alternative.
- The No Federal Action Alternative would have the same conditions as the NEPA baseline. Therefore, there would be no incremental difference between Alternative 2 and the NEPA baseline and Alternative 2 would result in no impacts under NEPA.

Figure 7-25 shows the MEI locations for cancer, chronic non-cancer, and acute non-cancer incremental impacts for Alternative 2.

Table 7-7. Maximum Incremental CEQA Health Impacts Associated with Alternative 2, No Federal Action Alternative without Mitigation

Health Impact	Receptor Type	Maximum Predicted Impact					Significance Threshold
		Alternative 2	NOP CEQA Baseline	NOP CEQA Increment	Future CEQA Baseline	Future CEQA Increment	
Cancer Risk	Residential - on Land	21 × 10-6 21 in a million	26 × 10-6 26 in a million	2 × 10-6 2 in a million	19 × 10-6 19 in a million	5 × 10-6 5 in a million	10 × 10-6 10 in a million
	Residential - in Marina	33 × 10-6 33 in a million	85 × 10-6 85 in a million	<0	25 × 10-6 25 in a million	7 × 10-6 7 in a million	
	Occupational	85 × 10-6 85 in a million	75 × 10-6 75 in a million	**10 × 10-6** **10 in a million**	63 × 10-6 63 in a million	**22 × 10-6** **22 in a million**	
	Sensitive	9 × 10-6 9 in a million	23 × 10-6 23 in a million	<0	8 × 10-6 8 in a million	2 × 10-6 2 in a million	
	Student	0.5 × 10-6 0.5 in a million	0.7 × 10-6 0.7 in a million	0.03 × 10-6 0.03 in a million	0.7 × 10-6 0.7 in a million	0.03 × 10-6 0.03 in a million	

Health Impact	Receptor Type	Maximum Predicted Impact					Significance Threshold
		Alternative 2	**NOP CEQA Baseline**	**NOP CEQA Increment**	**Future CEQA Baseline**	**Future CEQA Increment**	
	Recreational	15 × 10-6 15 in a million	39 × 10-6 39 in a million	1 × 10-6 1 in a million	12 × 10-6 12 in a million	3 × 10-6 3 in a million	
Chronic Hazard Index		**Alternative 2**	**NOP CEQA Baseline** [3]	**NOP CEQA Increment** [3]			1
	Residential - on Land	0.08	0.1	<0			
	Residential - in Marina	0.1	0.2	<0			
	Occupational	0.5	0.4	0.1			
	Sensitive	0.07	0.1	<0			
	Student	0.07	0.1	<0			
	Recreational	0.1	0.2	0.00009			
Acute Hazard Index	Residential - on Land	0.4	0.4	0.06			1
	Residential - in Marina	0.6	0.6	0.07			
	Occupational	1.0	0.9	0.1			
	Sensitive	0.4	0.3	0.06			
	Student	0.3	0.3	0.04			
	Recreational	0.6	0.6	0.08			
Cancer Burden				**NOP CEQA Increment**	**Future CEQA Increment**		0.5
				0.0005	0.07		

Notes:

1. Exceedances of the significance thresholds are in bold. The significance thresholds apply only to the increments.
2. The NOP CEQA increment represents the Alternative minus NOP CEQA baseline. The Future CEQA increment represents the Alternative minus Future CEQA baseline. The Future CEQA baseline and Future CEQA increments are only applicable to cancer risk because cancer risk is based on long-term (multiple-year) exposure periods.
3. Chronic and acute impacts are considered short-term impacts and are determined by comparing project-related impacts to the NOP CEQA baseline, the baseline at the time of the NOP in 2012.
4. Each result shown in the table represents the modeled receptor location with the maximum impact or increment. The impacts or increments at all other receptors would be less than the values in the table.
5. The displayed values for the Alternative and baseline impacts do not necessarily subtract to equal the displayed CEQA increments because they may occur at different receptor locations.
6. Construction emissions were modeled with the operational emissions for the determination of health impacts.
7. An increment less than zero means the Alternative impact would be less than the baseline impact at all modeled receptors.

Figure 7-25. MEI Locations for CEQA Health Increments – Alternative 2, No Federal Action Alternative without Mitigation

7.2.1.3 Alternative 3

Table 7-8 presents the maximum CEQA health impacts associated with Alternative 3 without mitigation. The table shows the following:

- Cancer Risk
  - In relation to the NOP CEQA baseline, the maximum incremental cancer risk is predicted to be less than the significance threshold at all receptor types except the occupational receptor. Cancer risk at the occupational receptor would exceed the significance threshold.
  - In relation to the Future CEQA baseline, the maximum incremental cancer risk is predicted to be less than the significance threshold at all receptor types except the marina-based residential and the occupational receptors. The cancer risk increment at the marina-based residential and occupational receptors would exceed the significance threshold.
- Cancer burden and non-cancer chronic and acute impacts would be below significance thresholds.
- Particulates: Morbidity and Mortality: Operation of Alternative 3 would result in a maximum off-site 24-hour $PM_{2.5}$ concentration increment that would not exceed the SCAQMD significance threshold of 2.5 µg/m3 (see EIR/EIS Section 3.2.4). Because the operational $PM_{2.5}$ concentrations would be less than significant and would not exceed the Port's criterion for calculating morbidity and mortality attributable to PM, potential mortality and morbidity effects were not quantified for this Alternative.

Table 7-9 presents the presents the maximum NEPA health impacts associated with Alternative 3 without mitigation. The table shows that the cancer risk, cancer burden, and non-cancer chronic and acute impacts would be less than significance thresholds at all receptor types.

Figure 7-26 shows the MEI locations for cancer, chronic non-cancer, and acute non-cancer CEQA incremental impacts for Alternative 3. Figure 7-27 shows the MEI locations for cancer, chronic non-cancer, and acute non-cancer NEPA incremental impacts for Alternative 3.

Table 7-8. Maximum Incremental CEQA Health Impacts Associated with Alternative 3, Reduced Project Alternative without Mitigation

Health Impact	Receptor Type	Maximum Predicted Impact					Significance Threshold
		Alternative 3	NOP CEQA Baseline	NOP CEQA Increment	Future CEQA Baseline	Future CEQA Increment	
Cancer Risk	Residential - on Land	23 × 10-6 23 in a million	26 × 10-6 26 in a million	5 × 10-6 5 in a million	19 × 10-6 19 in a million	6 × 10-6 6 in a million	10 × 10-6 10 in a million
	Residential - in Marina	37 × 10-6 37 in a million	85 × 10-6 85 in a million	<0	25 × 10-6 25 in a million	**11 × 10-6** **11 in a million**	
	Occupational	94 × 10-6 94 in a million	75 × 10-6 75 in a million	**19 × 10-6** **19 in a million**	63 × 10-6 63 in a million	**31 × 10-6** **31 in a million**	

Health Impact	Receptor Type	Maximum Predicted Impact					Significance Threshold
		Alternative 3	**NOP CEQA Baseline**	**NOP CEQA Increment**	**Future CEQA Baseline**	**Future CEQA Increment**	
	Sensitive	11 × 10-6 11 in a million	23 × 10-6 23 in a million	<0	8 × 10-6 8 in a million	3 × 10-6 3 in a million	
	Student	0.7 × 10-6 0.7 in a million	0.7 × 10-6 0.7 in a million	0.07 × 10-6 0.07 in a million	0.7 × 10-6 0.7 in a million	0.07 × 10-6 0.07 in a million	
	Recreational	17 × 10-6 17 in a million	39 × 10-6 39 in a million	2 × 10-6 2 in a million	12 × 10-6 12 in a million	5 × 10-6 5 in a million	
Chronic Hazard Index		**Alternative 3**	**NOP CEQA Baseline [3]**	**NOP CEQA Increment [3]**			1
	Residential - on Land	0.09	0.1	0.001			
	Residential - in Marina	0.1	0.2	<0			
	Occupational	0.6	0.4	0.2			
	Sensitive	0.08	0.1	<0			
	Student	0.08	0.1	<0			
	Recreational	0.1	0.2	0.005			
Acute Hazard Index	Residential - on Land	0.6	0.4	0.2			1
	Residential - in Marina	0.6	0.6	0.2			
	Occupational	1.1	0.9	0.6			
	Sensitive	0.5	0.3	0.2			
	Student	0.4	0.3	0.2			
	Recreational	0.6	0.6	0.3			
Cancer Burden				**NOP CEQA Increment**	**Future CEQA Increment**		0.5
				0.002	0.23		

Notes:

1. Exceedances of the significance thresholds are in bold. The significance thresholds apply only to the increments.

2. The NOP CEQA increment represents the Alternative minus NOP CEQA baseline. The Future CEQA increment represents the Alternative minus Future CEQA baseline. The Future CEQA baseline and Future CEQA increments are only applicable to cancer risk because cancer risk is based on long-term (multiple-year) exposure periods.

3. Chronic and acute impacts are considered short-term impacts and are determined by comparing Alternative-related impacts to the NOP CEQA baseline, the baseline at the time of the NOP in 2012.

4. Each result shown in the table represents the modeled receptor location with the maximum impact or increment. The impacts or increments at all other receptors would be less than the values in the table.

5. The displayed values for the Alternative and baseline impacts do not necessarily subtract to equal the displayed CEQA increments because they may occur at different receptor locations.

6. Construction emissions were modeled with the operational emissions for the determination of health impacts.

7. An increment less than zero means the Alternative impact would be less than the baseline impact at all modeled receptors.

Table 7-9. Maximum Incremental NEPA Health Impacts Associated with Alternative 3, Reduced Project Alternative without Mitigation

Health Impact	Receptor Type	Maximum Predicted Impact			Significance Threshold
		Alternative 3	NEPA Baseline	NEPA Increment	
Cancer Risk	Residential - on Land	23 × 10-6 23 in a million	21 × 10-6 21 in a million	3 × 10-6 3 in a million	10 × 10-6 10 in a million
	Residential - in Marina	37 × 10-6 37 in a million	33 × 10-6 33 in a million	4 × 10-6 4 in a million	
	Occupational	94 × 10-6 94 in a million	85 × 10-6 85 in a million	9 × 10-6 9 in a million	
	Sensitive	11 × 10-6 11 in a million	9 × 10-6 9 in a million	1 × 10-6 1 in a million	
	Student	0.7 × 10-6 0.7 in a million	0.5 × 10-6 0.5 in a million	0.1 × 10-6 0.1 in a million	
	Recreational	17 × 10-6 17 in a million	15 × 10-6 15 in a million	2 × 10-6 2 in a million	
Chronic Hazard Index	Residential - on Land	0.09	0.08	0.01	1
	Residential - in Marina	0.1	0.1	0.008	
	Occupational	0.6	0.5	0.2	
	Sensitive	0.08	0.07	0.01	
	Student	0.08	0.07	0.01	
	Recreational	0.1	0.1	0.02	
Acute Hazard Index	Residential - on Land	0.6	0.4	0.2	1
	Residential - in Marina	0.6	0.6	0.2	
	Occupational	1.1	1.0	0.5	
	Sensitive	0.5	0.4	0.1	
	Student	0.4	0.3	0.1	
	Recreational	0.6	0.6	0.2	
Cancer Burden				**NEPA Increment** 0.06	0.5

Notes:
1. The NEPA increment represents the Alternative minus NEPA baseline.
2. Each result shown in the table represents the modeled receptor location with the maximum impact or increment. The impacts or increments at all other receptors would be less than the values in the table.

3. The displayed values for the Alternative and baseline impacts do not necessarily subtract to equal the displayed NEPA increment because they may occur at different receptor locations.
4. Construction emissions were modeled with the operational emissions for the determination of health impacts.
5. An increment less than zero means the Alternative impact would be less than the baseline impact at all modeled receptors.

Figure 7-26. MEI Locations for CEQA Health Increments – Alternative 3, Reduced Project Alternative without Mitigation

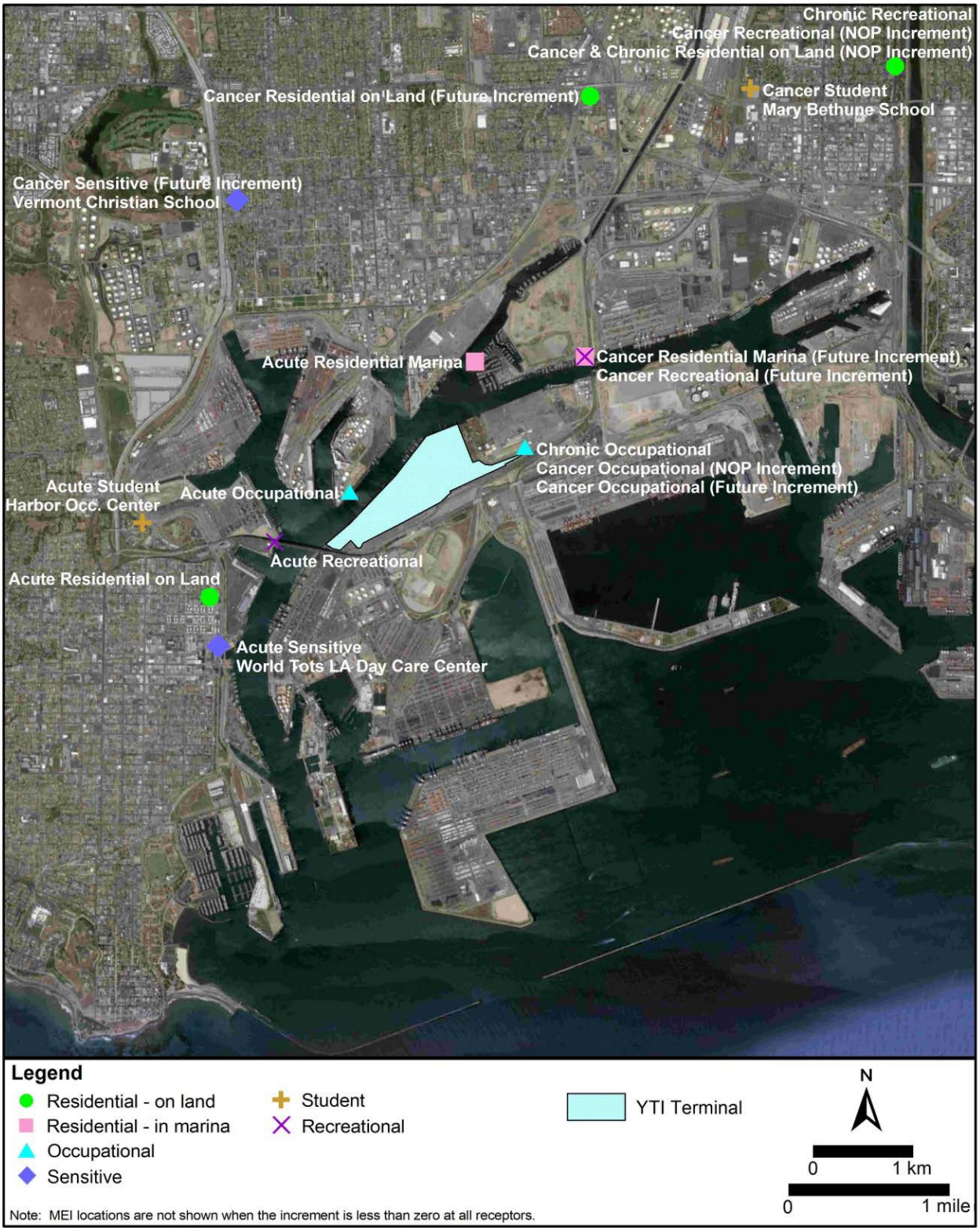
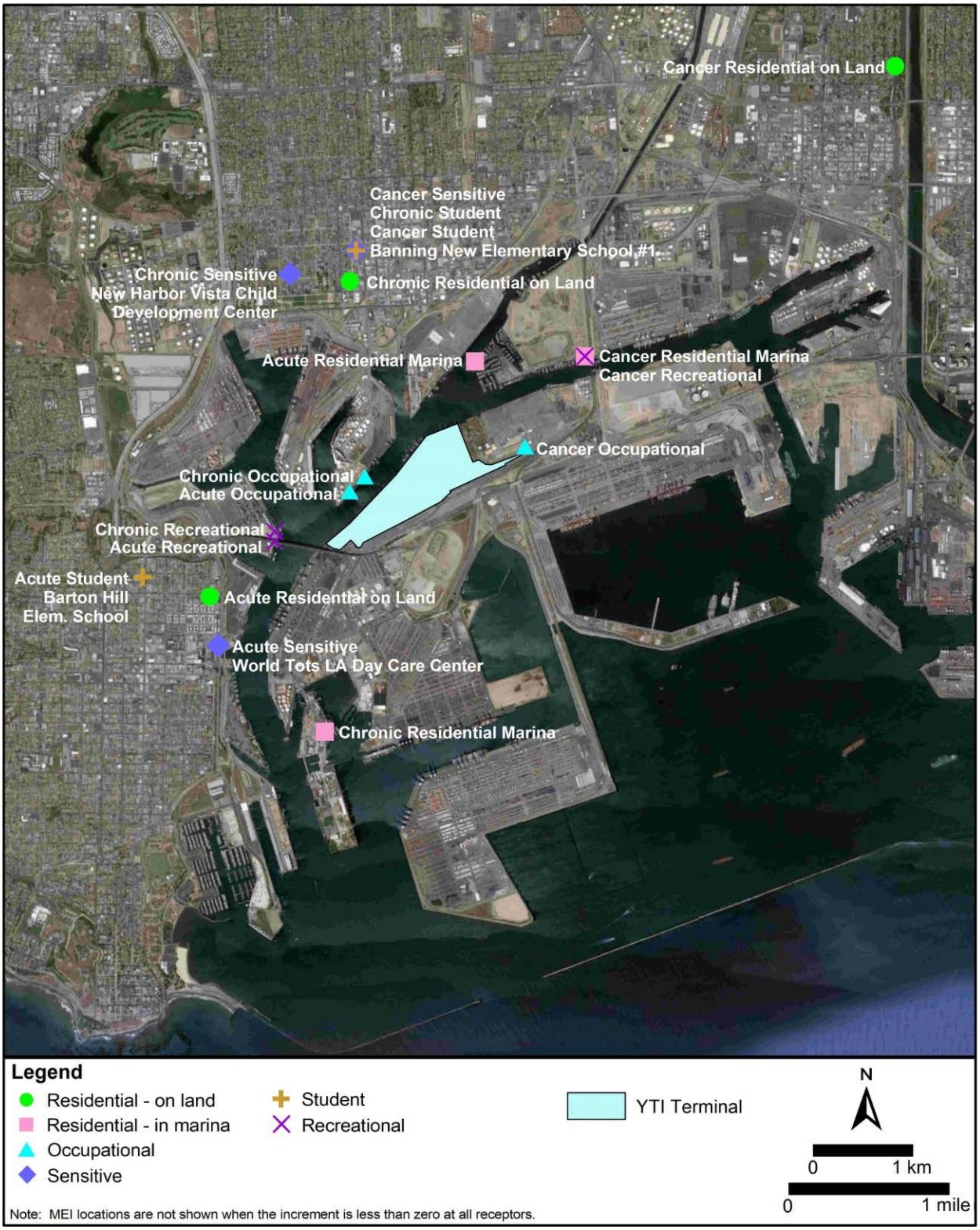


Figure 7-27. MEI Locations for NEPA Health Increments – Alternative 3, Reduced Project Alternative without Mitigation



7.2.2 Mitigated Impacts

7.2.2.1 Alternative 1

Mitigation is not required under CEQA for Alternative 1 because there would be no discretionary action subject to CEQA.

7.2.2.2 Alternative 2

Table 7-10 presents the maximum CEQA health impacts associated with Alternative 2, following mitigation. The table shows that in relation to the NOP CEQA baseline, cancer risk would not change appreciably from the unmitigated scenario because cancer risk would be driven by truck exhaust, for which mitigation beyond the Clean Truck Program is not feasible. The table also shows that in relation to the Future CEQA baseline, cancer risk would not change appreciably from the unmitigated scenario because cancer risk would be driven by truck exhaust, for which project-level mitigation not feasible.

Figure 7-28 shows the MEI locations for cancer, chronic non-cancer, and acute non-cancer incremental impacts for Alternative 2 with mitigation.

Table 7-10. Maximum Incremental CEQA Health Impacts Associated with Alternative 2, No Federal Action Alternative with Mitigation

Health Impact	Receptor Type	Maximum Predicted Impact					Significance Threshold
		Alternative 2	NOP CEQA Baseline	NOP CEQA Increment	Future CEQA Baseline	Future CEQA Increment	
Cancer Risk	Residential - on Land	21 × 10-6 21 in a million	26 × 10-6 26 in a million	2 × 10-6 2 in a million	19 × 10-6 19 in a million	4 × 10-6 4 in a million	10 × 10-6 10 in a million
	Residential - in Marina	32 × 10-6 32 in a million	85 × 10-6 85 in a million	<0	25 × 10-6 25 in a million	7 × 10-6 7 in a million	
	Occupational	85 × 10-6 85 in a million	75 × 10-6 75 in a million	**10 × 10-6** **10 in a million**	63 × 10-6 63 in a million	**22 × 10-6** **22 in a million**	
	Sensitive	9 × 10-6 9 in a million	23 × 10-6 23 in a million	<0	8 × 10-6 8 in a million	2 × 10-6 2 in a million	
	Student	0.5 × 10-6 0.5 in a million	0.7 × 10-6 0.7 in a million	0.03 × 10-6 0.03 in a million	0.7 × 10-6 0.7 in a million	0.03 × 10-6 0.03 in a million	
	Recreational	15 × 10-6 15 in a million	39 × 10-6 39 in a million	1 × 10-6 1 in a million	12 × 10-6 12 in a million	3 × 10-6 3 in a million	
Chronic Hazard Index		**Alternative 2**	**NOP CEQA Baseline** [3]	**NOP CEQA Increment** [3]			1
	Residential - on Land	0.08	0.1	<0			
	Residential - in Marina	0.1	0.2	<0			
	Occupational	0.5	0.4	0.1			
	Sensitive	0.07	0.1	<0			
	Student	0.07	0.1	<0			

Health Impact	Receptor Type	Maximum Predicted Impact					Significance Threshold
		Alternative 2	NOP CEQA Baseline	NOP CEQA Increment	Future CEQA Baseline	Future CEQA Increment	
	Recreational	0.1	0.2	0.00007			
Acute Hazard Index	Residential - on Land	0.4	0.4	0.06			1
	Residential - in Marina	0.6	0.6	0.07			
	Occupational	1.0	0.9	0.1			
	Sensitive	0.4	0.3	0.06			
	Student	0.3	0.3	0.04			
	Recreational	0.6	0.6	0.08			
Cancer Burden				NOP CEQA Increment	Future CEQA Increment		0.5
				0.0004	0.03		

Notes:

1. Exceedances of the significance thresholds are in bold. The significance thresholds apply only to the increments.
2. The NOP CEQA increment represents the Alternative minus NOP CEQA baseline. The Future CEQA increment represents the Alternative minus Future CEQA baseline. The Future CEQA baseline and Future CEQA increments are only applicable to cancer risk because cancer risk is based on long-term (multiple-year) exposure periods.
3. Chronic and acute impacts are considered short-term impacts and are determined by comparing project-related impacts to the NOP CEQA baseline, the baseline at the time of the NOP in 2012.
4. Each result shown in the table represents the modeled receptor location with the maximum impact or increment. The impacts or increments at all other receptors would be less than the values in the table.
5. The displayed values for the Alternative and baseline impacts do not necessarily subtract to equal the displayed CEQA increments because they may occur at different receptor locations.
6. Construction emissions were modeled with the operational emissions for the determination of health impacts.
7. An increment less than zero means the Alternative impact would be less than the baseline impact at all modeled receptors.

Figure 7-28. MEI Locations for CEQA Health Increments – Alternative 2, No Federal Action Alternative with Mitigation

7.2.2.3 Alternative 3

Table 7-11 presents the maximum CEQA health impacts associated with Alternative 3, following mitigation. The table shows that in relation to the NOP CEQA baseline, cancer risk would not change appreciably from the unmitigated scenario because cancer risk would be driven by truck exhaust, for which mitigation beyond the Clean Truck Program is not feasible. The table also shows that in relation to the Future CEQA baseline, cancer risk would not change appreciably from the unmitigated scenario because cancer risk would be driven by truck and locomotive exhaust, for which project-level mitigation not feasible. Tables showing NEPA impacts following mitigation are not presented; mitigation is not required under NEPA since unmitigated impacts would be less than significance thresholds.

Figure 7-29 shows the MEI locations for cancer, chronic non-cancer, and acute non-cancer incremental impacts for Alternative 3 with mitigation.

Table 7-11. Maximum Incremental CEQA Health Impacts Associated with Alternative 3, Reduced Project Alternative with Mitigation

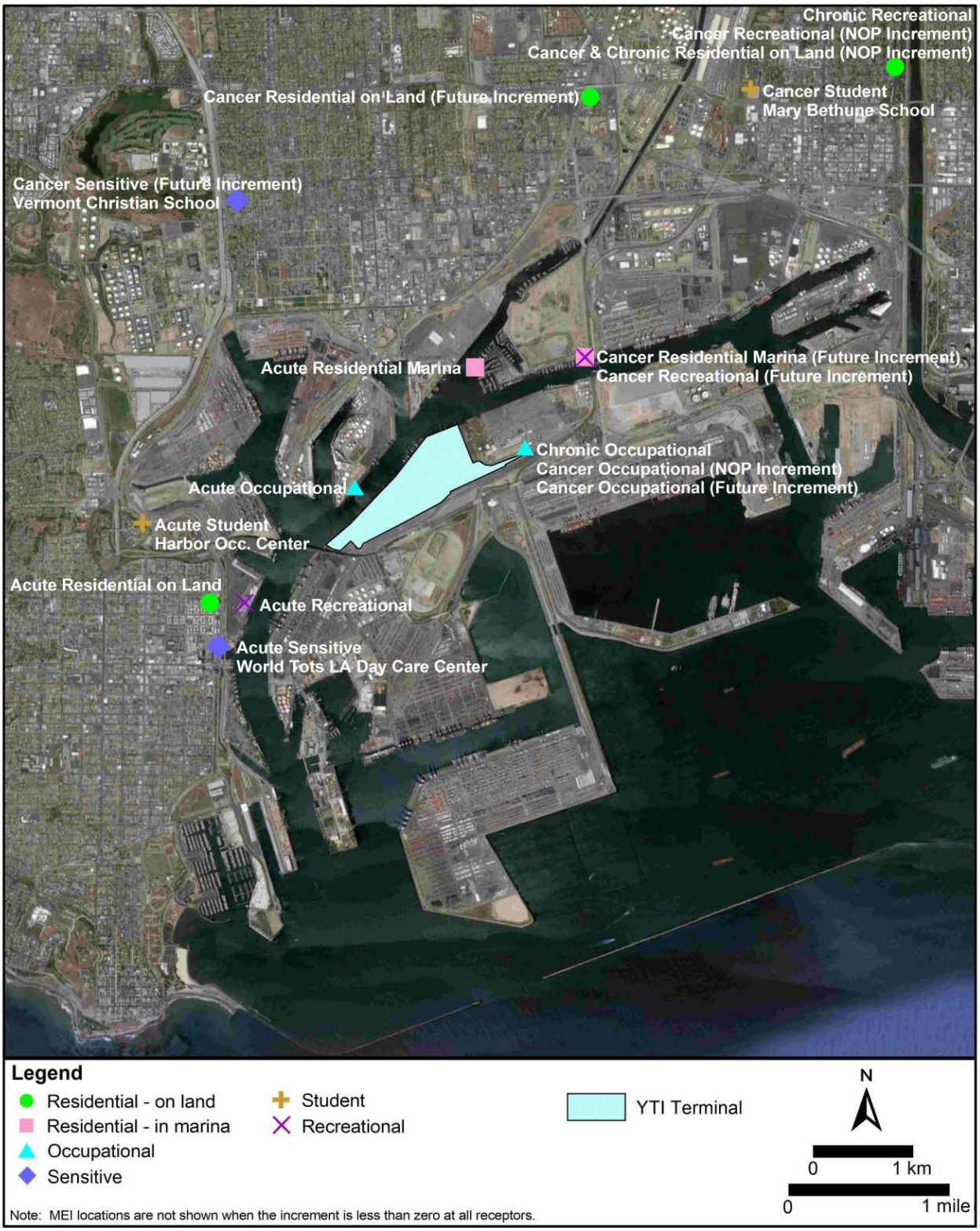
Health Impact	Receptor Type	Maximum Predicted Impact					Significance Threshold
		Alternative 3	**NOP CEQA Baseline**	**NOP CEQA Increment**	**Future CEQA Baseline**	**Future CEQA Increment**	
Cancer Risk	Residential - on Land	23 × 10-6 23 in a million	26 × 10-6 26 in a million	5 × 10-6 5 in a million	19 × 10-6 19 in a million	6 × 10-6 6 in a million	10 × 10-6 10 in a million
	Residential - in Marina	36 × 10-6 36 in a million	85 × 10-6 85 in a million	<0	25 × 10-6 25 in a million	**11 × 10-6** **11 in a million**	
	Occupational	94 × 10-6 94 in a million	75 × 10-6 75 in a million	**19 × 10-6** **19 in a million**	63 × 10-6 63 in a million	**31 × 10-6** **31 in a million**	
	Sensitive	10 × 10-6 10 in a million	23 × 10-6 23 in a million	<0	8 × 10-6 8 in a million	3 × 10-6 3 in a million	
	Student	0.6 × 10-6 0.6 in a million	0.7 × 10-6 0.7 in a million	0.05 × 10-6 0.05 in a million	0.7 × 10-6 0.7 in a million	0.05 × 10-6 0.05 in a million	
	Recreational	17 × 10-6 17 in a million	39 × 10-6 39 in a million	2 × 10-6 2 in a million	12 × 10-6 12 in a million	5 × 10-6 5 in a million	
Chronic Hazard Index		**Alternative 3**	**NOP CEQA Baseline** [3]	**NOP CEQA Increment** [3]			1
	Residential - on Land	0.09	0.1	0.001			
	Residential - in Marina	0.1	0.2	<0			
	Occupational	0.6	0.4	0.2			
	Sensitive	0.08	0.1	<0			
	Student	0.08	0.1	<0			
	Recreational	0.1	0.2	0.005			
Acute Hazard Index	Residential - on Land	0.5	0.4	0.2			1
	Residential - in Marina	0.6	0.6	0.2			

Health Impact	Receptor Type	Maximum Predicted Impact					Significance Threshold
		Alternative 3	NOP CEQA Baseline	NOP CEQA Increment	Future CEQA Baseline	Future CEQA Increment	
	Occupational	1.1	0.9	0.3			
	Sensitive	0.5	0.3	0.2			
	Student	0.4	0.3	0.1			
	Recreational	0.6	0.6	0.2			
Cancer Burden				NOP CEQA Increment		Future CEQA Increment	0.5
				0.002		0.18	

Notes:

1. Exceedances of the significance thresholds are in bold. The significance thresholds apply only to the increments.
2. The NOP CEQA increment represents the Alternative minus NOP CEQA baseline. The Future CEQA increment represents the Alternative minus Future CEQA baseline. The Future CEQA baseline and Future CEQA increments are only applicable to cancer risk because cancer risk is based on long-term (multiple-year) exposure periods.
3. Chronic and acute impacts are considered short-term impacts and are determined by comparing project-related impacts to the NOP CEQA baseline, the baseline at the time of the NOP in 2012.
4. Each result shown in the table represents the modeled receptor location with the maximum impact or increment. The impacts or increments at all other receptors would be less than the values in the table.
5. The displayed values for the Alternative and baseline impacts do not necessarily subtract to equal the displayed CEQA increments because they may occur at different receptor locations.
6. Construction emissions were modeled with the operational emissions for the determination of health impacts.
7. An increment less than zero means the Alternative impact would be less than the baseline impact at all modeled receptors.

Figure 7-29. MEI Locations for CEQA Health Increments – Alternative 3, Reduced Project Alternative with Mitigation



8.0 Risk Uncertainty

Health risk assessments such as the one presented in this Appendix are not intended to provide estimates of the absolute health risk or expected incidence of disease in a population, but instead, are conducted to allow comparisons of the potential health impacts of different alternatives. Consistent with agency guidelines and standard approaches to regulatory risk assessment, this risk assessment used health-protective (conservative) assumptions selected by regulatory agencies to "err on the side of health protection in order to avoid underestimation of risk to the public" (OEHHA 2003). As an example of the conservative assumptions used in this risk assessment, residential receptors are considered to be exposed to TACs while individuals are present at the same outdoor location for 365 days per year for 70 years, breathing continuously at a rate that is at the 80th percentile of breathing rates for the population.

OEHHA has provided a discussion of risk uncertainty, which is reiterated here (OEHHA 2003).

There is a great deal of uncertainty associated with the process of risk assessment. The uncertainty arises from lack of data in many areas necessitating the use of assumptions. The assumptions used in these guidelines are designed to err on the side of health protection in order to avoid underestimation of risk to the public. Sources of uncertainty, which may either overestimate or underestimate risk, include: 1) extrapolation of toxicity data in animals to humans, 2) uncertainty in the estimation of emissions, 3) uncertainty in the air dispersion models, and 4) uncertainty in the exposure estimates. Uncertainty may be defined as what is not known and may be reduced with further scientific studies. In addition to uncertainty, there is a natural range or variability in the human population in such properties as height, weight, and susceptibility to chemical toxicants. Scientific studies with representative individuals and large enough sample size can characterize this variability.

Interactive effects of exposure to more than one carcinogen or toxicant are also not necessarily quantified in the HRA. Cancer risks from all emitted carcinogens are typically added, and hazard quotients for substances impacting the same target organ system are added to determine the hazard index (HI). Many examples of additivity and synergism (interactive effects greater than additive) are known. For substances that act synergistically, the HRA could underestimate the risks. Some substances may have antagonistic effects (lessen the toxic effects produced by another substance). For substances that act antagonistically, the HRA could overestimate the risks.

Other sources of uncertainty, which may underestimate or overestimate risk, can be found in exposure estimates where little or no data are available (e.g., soil half-life and dermal penetration of some substances from a soil matrix).

The differences among species and within human populations usually cannot be easily quantified and incorporated into risk assessments. Factors including metabolism, target site sensitivity, diet, immunological responses, and genetics may influence the response to toxicants. The human population is much more diverse both genetically and culturally (e.g., lifestyle, diet) than inbred experimental animals. The intraspecies variability among humans is expected to be much greater than in laboratory animals. Adjustment for tumors at multiple sites induced by some carcinogens could result in a higher potency. Other uncertainties arise 1) in the assumptions underlying the

dose-response model used, and 2) in extrapolating from large experimental doses, where, for example, other toxic effects may compromise the assessment of carcinogenic potential, to usually much smaller environmental doses. Also, only single tumor sites induced by a substance are usually considered. When epidemiological data are used to generate a carcinogenic potency, less uncertainty is involved in the extrapolation from workplace exposures to environmental exposures. However, children, a subpopulation whose hematological, nervous, endocrine, and immune systems, for example, are still developing and who may be more sensitive to the effects of carcinogens on their developing systems, are not included in the worker population and risk estimates based on occupational epidemiological data are more uncertain for children than adults. Finally, the quantification of each uncertainty applied in the estimate of cancer potency is itself uncertain.

Thus, risk estimates generated by an HRA should not be interpreted as the expected rates of disease in the exposed population but rather as estimates of potential risk, based on current knowledge and a number of assumptions. Additionally, the uncertainty factors integrated within the estimates of non-cancer RELs are meant to err on the side of public health protection in order to avoid underestimation of risk. Risk assessment is best used as a ruler to compare one source with another and to prioritize concerns. Consistent approaches to risk assessment are necessary to fulfill this function.

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