Appendix E3

Health Risk Assessment Technical Memorandum

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Appendix E3
Health Risk Assessment

1.0 Introduction

This document describes the methods and results of a health risk assessment (HRA) that evaluates potential public health effects from toxic air contaminant (TAC) emissions generated by the operation of the Port of Los Angeles (Port) Container Terminal Project (Project or proposed Project) at Berths 302-306 (APL). TACs are compounds that are known or suspected to cause adverse health effects after short-term (acute) or long-term (chronic) exposure.

The HRA evaluated health risks associated with the following scenarios:

- CEQA Baseline (July 1, 2008 through June 30, 2009)
- Proposed Project with and without mitigation
- Alternative 2 (NEPA Baseline/No Federal Action) without mitigation
- Alternative 3 (Reduce Project: 4 New Cranes) with and without mitigation
- Alternative 4 (Reduced Project: No New Wharf) with and without mitigation
- Alternative 5 (Reduced Project: No Space Assignment) with and without mitigation
- Alternative 6 (Proposed Project with Expanded On-Dock Rail Yard) with and without mitigation

The HRA analyzed proposed Project and alternative emissions and potential human exposure to the emissions during the 70-year period from 2012 through 2081.

The HRA evaluated incremental health risks calculated from the difference in impact between the proposed Project and the California Environmental Quality Act (CEQA) baseline, and between the proposed Project and the National Environmental Policy Act (NEPA) baseline. The CEQA baseline utilizes the throughput volume accommodated at the Berths 302-305 during the yearlong period from July 2008 through the end of June 2009. The NEPA Baseline or No Federal Action Alternative represents the set of conditions that would occur without Federal action, but could include improvements that do not require Federal action.

This HRA was prepared in accordance with the *Health Risk Assessment Protocol for Port of Los Angeles Terminal Improvement Projects* (Protocol) (Port of Los Angeles, 2005). In general, the Protocol follows the methodology for preparing risk assessments described in the *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments* (OEHHA, 2003), *Supplemental Guidelines for Preparing Risk*

Assessments for the Air Toxics "Hot Spots" Information and Assessment Act (AB2588) (SCAQMD, 2005), 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 1.4c (CARB, 2010a) used in the HRA incorporates the methods in these guidance documents.

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 to compare 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 Development of Emissions

Emission sources included both construction and operational emission sources. Construction emissions were assumed to occur during the calendar years 2012 and 2013. Operational emissions were analyzed in 2012, 2015, 2020, 2025 and 2027 for the proposed Project and alternatives, and either interpolated or extrapolated to estimate emissions for 70 years from 2012 through 2081. Operational emissions for the CEQA Baseline were estimated for the 12-month period from July 1, 2008 through June 30, 2009.

2.1 Construction Emission Sources

Construction emissions included in the analysis of acute risk represent the maximum daily construction emissions in any calendar quarter. Emissions included in the chronic risk analysis were developed using the peak year of construction activity, and emissions included in the 40-year and 70-year cancer risk calculations were based on the emissions from the entire construction period.

Based on the construction schedule, maximum daily, annual, and total construction emissions were calculated by individual activity. Daily emissions for overlapping activities were summed for each calendar quarter. Maximum daily construction emissions are expected to occur in Quarter 2 of 2012, and include the following simultaneous activities.

- Phase 1a: B302-305 Maintenance Dredging (55,000 cy);
- Phase 1c: B302-305 AMP;
- Phase 1h: B302-306 Crane Delivery;
- Phase 1b: RB301: Redevelopment of 9 acres of former LAXT backland;
- Phase 1e: Construction of Roadways/Gen Set building and canopies;
- Phase 1e: Construction of a two story expansion to the Power Shop Building;
- Phase 1g: Development of various utility infrastructure; and

- Phase 1f: Expansion of reefer area.

Peak annual emissions occur in 2012, and include the same activities that occur in the peak daily analysis with the addition of Phase 2: Grading, paving and stripping. Total construction emissions include activity in Phases 1a-e (including Phase 1d: Demolish Roadability Canopy and Building) and Phase 2 that extend into 2013.

Consistent with SCAQMD policy only onsite construction emissions were included in the HRA. Onsite emission sources for construction included the following:

- Construction equipment and on-site vehicle activity, including backhoes, dozers, cranes, forklifts, graders, loaders, generators, water trucks and on-road vehicles.
- Ships turning and docking – final positioning of the gantry crane delivery ships near the berth .
- Ships hoteling – while at berth for delivery of gantry cranes, including emissions from the ship boilers and auxiliary emissions. The main propulsion engine does not operate while the ship is hoteling. For construction, it was assumed that alternative maritime power (AMP) will not be used in lieu of the auxiliary engines while crane delivery ships are hoteling.

2.2 Operational Emissions

Consistent with SCAQMD policy, the HRA included both on-site and off-site operational emission sources. The following operational emission sources were included in the health risk assessment:

- Ships transitioning to and from the berths in waters within SCAQMD jurisdiction, consisting of the following segments:
    - Fairway transit – The portion of transit between the SCAQMD overwater boundary, about 40 nautical miles (nm) from Point Fermin (about 51 nm from the Berth 302-306 terminal) and 20 nm from Point Fermin;
    - Precautionary Zone transit – The portion of transit between Point Fermin and the Port breakwater, approximately 19 nm;
    - Harbor transit – The portion of transit between the Port breakwater and the terminal, about 7 nm inbound and 8 nm outbound; and
    - Turning and Docking – Final positioning of the ship near the berth.
- Ships hoteling while at berth for cargo unloading, including emissions from the ship boilers and auxiliary emissions. The main propulsion engine does not operate while the ship is hoteling. According to CARB regulation (need reference), alternative maritime power (AMP) is assumed to be used in lieu of the auxiliary engines while ships are hoteling for the following percentage of ships in the Project study years: no AMP in 2012, 50% in 2015, 80% in 2020 through 2027.
- Tugboats used to assist container ship transit between the Port breakwater and the berth. It was assumed that two tugboats are used for each ship assist. Emission sources include the tugboat main propulsion engine and auxiliary engines.
- Rail Yard Equipment and Locomotives – switching engines and line haul locomotives, and transit from Terminal Island to Anaheim St.

- Trucks traveling along Project-related container haul routes as provided by the traffic consultant, including:
  - I-110 from Anaheim St. to Vincent Thomas Bridge
  - I-710 from Anaheim St. to 47 on Terminal Island
  - Queuing at In-Gate
  - From APL Terminal to Ocean Blvd.
  - Highway 47 on Terminal Island
  - Vincent Thomas Bridge
  - 47 on Terminal Island between Henry Ford and Ocean Blvd.
  - 47 N: Anaheim to Henry Ford
  - Henry Ford Ave.
- Terminal Cargo Handling Equipment (CHE), including yard tractors, RTGs, top handlers, sidepicks, forklifts, and other miscellaneous equipment. Without mitigation, all equipment is assumed to be diesel powered with the exception of a certain number of propane powered forklifts. The marine terminal cranes used to lift containers on and off container ships would be electric and, therefore, would have no direct emissions.

2.3 TAC Emission Calculation Approach

The following averaging periods were used to determine toxic air contaminant emission rates for use in the HRA:

- Cancer risk for residential, student, recreational and sensitive receptors was based on 70-year average emission rates;
- Cancer risk for occupational receptors was based on 40-year average emission rates;
- Chronic hazard index for all receptors was conservatively based on the maximum annual emission rate, as the chronic exposure period for noncancer effects is assumed to be up to 8 years; and
- Acute hazard index for all receptors was based on the maximum 1-hour emission rate.

The calculation of 70-year and 40-year average emission rates required integrating assumptions regarding the operational characteristics of emission sources projected into the future. One important factor that would affect 70- and 40-year average emissions is reductions in emission factors from phasing in cleaner vehicles due to normal fleet turnover, given that newer vehicles are subject to existing regulations. The 70- and 40-year emissions would also be affected by increased vehicle activity levels caused by increased container throughput.

The proposed Project toxic air contaminant emission rates used for analyzing acute and chronic hazard indices were calculated by first determining the peak hourly and annual emissions, respectively, for each emissions source (rail, ships, tugboats, CHE, trucks, and worker trips in each Project study year. To ensure that the highest acute and chronic health hazard indices are captured, the maximum emissions from each source group over the entire Project period were combined to create a conservative composite worst-case peak hour and peak year emissions inventory.

The cancer risk for residential, student, recreational, and sensitive receptors was calculated using a 70-year average emission rate for each applicable toxic air contaminant in the CEQA baseline, NEPA baseline, and the proposed Project.

2.3.1 CEQA Baseline

A primary and a secondary methodology were used to develop the CEQA baseline 70-year average 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. Under both methodologies, the activity levels (e.g., TEU throughput, ship calls, truck trips, etc.) were held constant for all emission sources at the baseline (July 1, 2008 through June 30, 2009) level. A significance determination regarding the health risk assessment is made for each methodology. The CEQA incremental impact will be based on the more conservative result (highest incremental impact).

2.3.1.1 NOP CEQA Baseline

For the NOP methodology, the emission factors were also held constant at the values for the CEQA baseline period. The resulting annual emissions were used to represent the 70-year average emissions for the CEQA baseline risk calculations. This approach is consistent with the Sunnyvale decision regarding the CEQA baseline analyses.

2.3.1.2 Future CEQA Baseline

For the future methodology, the emission factors were allowed to change over time according to the regulatory requirements that would be applicable to the terminal sources in the future, including the installation of AMP and manufacturer of lower emission diesel engines according to ARB regulations. This approach is consistent with the methodology developed by the Port for previous project HRAs (LAHD 2007, LAHD 2008) and with the recent Pfeiffer decision regarding CEQA baseline analyses.

Emission rates were interpolated between known changes in emission factors due to regulation, and were held constant after the analysis surpassed the extent of existing regulation. After emissions had been determined for the CEQA baseline 70-year period, a single 70-year average emissions rate was determined for use in the CEQA baseline cancer risk determination.

2.3.2 NEPA Baseline and Proposed Project

The 70-year average emission rates for the NEPA baseline and the proposed Project were calculated for the period from 2012 to 2081. Emissions were determined based on the activity levels for the five study years: 2012, 2015, 2020, 2025 and 2027 for both the NEPA baseline and the proposed Project. The activity in 2027 was held constant for the remainder of the 70-year period. Emission factors were updated over time according to the regulatory requirements that would be applicable to the terminal sources in the future, and were held constant after the analysis surpassed the extent of existing regulation. Emissions were interpolated between study years to determine emissions in the interim years of the 70-year period, and a single 70-year average emission rate was calculated based on the calculated emissions over the entire period.

2.4 TAC Emission Rates

Tables 2-1 through 2-5 contain total emission rates for 70-year average, 40-year average, maximum annual and maximum 1-hour periods; for the NOP CEQA Baseline, future CEQA Baseline, NEPA Baseline and proposed Project cases, respectively. Each emission rate represents the summed emissions for all sources for the case and averaging period indicated.

Table 2-1. Toxic Air Contaminant Emissions for All Sources – NOP CEQA Baseline

Toxic Air Contaminant	70-Year Average Emissions (lb/yr)	40-Year Average Emissions (lb/yr)	Maximum Annual Emissions (lb/yr)	Maximum 1-hr Emissions (lb/hr)
Diesel PM (DPM)	1.32E+05	1.32E+05	8.23E+04	5.99E+01
Arsenic	6.40E+01	6.40E+01	6.13E+01	2.15E-02
Bromine	1.67E-01	1.67E-01	1.67E-01	1.36E-03
Cadmium	5.94E+00	5.94E+00	5.69E+00	4.22E-03
Chlorine	1.55E+01	1.55E+01	1.55E+01	6.05E-02
Chromium VI	3.20E+00	3.20E+00	3.06E+00	1.10E-03
Copper	1.11E+00	1.11E+00	1.11E+00	2.75E-03
Lead	6.59E+01	6.59E+01	6.32E+01	2.48E-02
Manganese	5.64E+00	5.64E+00	5.64E+00	8.37E-03
Mercury	6.25E-02	6.25E-02	6.25E-02	1.74E-03
Nickel	6.08E+00	6.08E+00	5.83E+00	3.38E-03
Selenium	5.93E+00	5.93E+00	5.68E+00	2.53E-03
Sulfates	3.05E+03	3.05E+03	2.92E+03	3.75E+00
Vanadium	4.93E-01	4.93E-01	4.93E-01	2.14E-03
1,3-Butadiene	1.01E+01	1.01E+01	1.01E+01	1.46E-01
Acetaldehyde	6.28E+00	6.28E+00	6.28E+00	4.32E+00
Benzene	8.55E+01	8.55E+01	8.40E+01	1.34E+00
Chlorobenzene	8.25E-01	8.25E-01	7.90E-01	2.73E-04
Ethylbenzene	2.10E+01	2.10E+01	2.09E+01	2.45E-01
Formaldehyde	6.07E+01	6.07E+01	6.06E+01	8.71E+00
Xylenes	5.61E+00	5.61E+00	5.37E+00	1.86E-03
Methanol	2.27E+00	2.27E+00	2.27E+00	2.53E-02
Methyl ethyl ketone (MEK)	3.39E-01	3.39E-01	3.39E-01	8.65E-01
m-Xylene	7.39E+01	7.39E+01	7.36E+01	5.85E-01
Naphthalene	2.03E+00	2.03E+00	1.98E+00	5.31E-02
Hexane	5.66E+01	5.66E+01	5.55E+01	2.02E-01
o-Xylene	2.84E+01	2.84E+01	2.82E+01	2.76E-01
Propylene	1.94E+02	1.94E+02	1.91E+02	1.75E+00
p-Xylene	0.00E+00	0.00E+00	0.00E+00	5.56E-02
Styrene	2.28E+00	2.28E+00	2.28E+00	4.17E-02
Toluene	1.44E+02	1.44E+02	1.42E+02	1.24E+00
Acrolein	2.46E+00	2.46E+00	2.46E+00	8.36E-03

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Table 2-2. Toxic Air Contaminant Emissions for All Sources – Future CEQA Baseline

Toxic Air Contaminant	70-Year Average Emissions (lb/yr)	40-Year Average Emissions (lb/yr)	Maximum Annual Emissions (lb/yr)	Maximum 1-hr Emissions (lb/hr)
Diesel PM (DPM)	1.78E+04	2.18E+04	8.23E+04	5.99E+01
Arsenic	1.58E+01	1.71E+01	6.13E+01	2.15E-02
Bromine	9.18E-02	8.34E-02	1.67E-01	1.36E-03
Cadmium	1.47E+00	1.60E+00	5.69E+00	4.22E-03
Chlorine	4.89E+00	3.70E+00	1.55E+01	6.05E-02
Chromium VI	7.90E-01	8.57E-01	3.06E+00	1.10E-03
Copper	1.04E+00	1.03E+00	1.11E+00	2.75E-03
Lead	1.68E+01	1.82E+01	6.32E+01	2.48E-02
Manganese	5.57E+00	5.56E+00	5.64E+00	8.37E-03
Mercury	6.25E-02	6.25E-02	6.25E-02	1.74E-03
Nickel	1.54E+00	1.66E+00	5.83E+00	3.38E-03
Selenium	1.47E+00	1.59E+00	5.68E+00	2.53E-03
Sulfates	7.52E+02	8.07E+02	2.92E+03	3.75E+00
Vanadium	4.93E-01	4.93E-01	4.93E-01	2.14E-03
1,3-Butadiene	4.66E+00	5.04E+00	1.01E+01	1.46E-01
Acetaldehyde	2.53E+00	2.58E+00	6.28E+00	4.32E+00
Benzene	6.51E+01	6.61E+01	8.40E+01	1.34E+00
Chlorobenzene	1.01E+00	1.00E+00	7.90E-01	2.73E-04
Ethylbenzene	1.04E+01	1.11E+01	2.09E+01	2.45E-01
Formaldehyde	1.93E+01	1.66E+01	6.06E+01	8.71E+00
Xylenes	6.93E+00	6.81E+00	5.37E+00	1.86E-03
Methanol	1.04E+00	1.13E+00	2.27E+00	2.53E-02
Methyl ethyl ketone (MEK)	1.56E-01	1.69E-01	3.39E-01	8.65E-01
m-Xylene	3.95E+01	4.19E+01	7.36E+01	5.85E-01
Naphthalene	1.81E+00	1.84E+00	1.98E+00	5.31E-02
Hexane	4.57E+01	4.66E+01	5.55E+01	2.02E-01
o-Xylene	1.69E+01	1.76E+01	2.82E+01	2.76E-01
Propylene	1.26E+02	1.20E+02	1.91E+02	1.75E+00
p-Xylene	0.00E+00	0.00E+00	0.00E+00	5.56E-02
Styrene	1.05E+00	1.13E+00	2.28E+00	4.17E-02
Toluene	9.26E+01	9.62E+01	1.42E+02	1.24E+00
Acrolein	1.13E+00	1.22E+00	2.46E+00	8.36E-03

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Table 2-3. Toxic Air Contaminant Emissions for All Sources – NEPA Baseline

Toxic Air Contaminant	70-Year Average Emissions (lb/yr)	40-Year Average Emissions (lb/yr)	Maximum Annual Emissions (lb/yr)	Maximum 1-hr Emissions (lb/hr)
Diesel PM (DPM)	2.65E+04	2.68E+04	3.24E+04	1.62E+01
Arsenic	1.41E+01	1.41E+01	1.42E+01	3.98E-03
Bromine	5.09E-01	4.68E-01	3.66E-01	7.00E-04
Cadmium	1.34E+00	1.34E+00	1.34E+00	9.83E-04
Chlorine	4.90E+01	4.52E+01	3.55E+01	5.53E-02
Chromium VI	7.11E-01	7.11E-01	7.13E-01	2.06E-04
Copper	3.17E+00	2.91E+00	2.24E+00	1.97E-03
Lead	1.67E+01	1.65E+01	1.60E+01	5.56E-03
Manganese	1.61E+01	1.49E+01	1.12E+01	7.78E-03
Mercury	1.78E-01	1.65E-01	1.24E-01	5.31E-04
Nickel	1.81E+00	1.77E+00	1.66E+00	1.07E-03
Selenium	1.33E+00	1.33E+00	1.33E+00	5.20E-04
Sulfates	9.33E+02	9.15E+02	8.56E+02	3.93E+00
Vanadium	1.40E+00	1.30E+00	9.77E-01	1.05E-03
1,3-Butadiene	8.87E+00	9.60E+00	1.49E+01	1.45E-01
Acetaldehyde	4.54E+00	4.91E+00	7.65E+00	4.63E+00
Benzene	8.39E+01	8.72E+01	1.12E+02	1.39E+00
Chlorobenzene	1.01E+00	1.01E+00	1.02E+00	2.77E-04
Ethylbenzene	1.84E+01	1.98E+01	3.02E+01	2.42E-01
Formaldehyde	2.76E+01	2.97E+01	4.53E+01	9.31E+00
Xylenes	6.88E+00	6.88E+00	6.95E+00	1.88E-03
Methanol	1.98E+00	2.14E+00	3.35E+00	2.47E-02
Methyl ethyl ketone (MEK)	2.96E-01	3.20E-01	5.01E-01	9.28E-01
m-Xylene	6.69E+01	7.16E+01	1.07E+02	5.57E-01
Naphthalene	2.18E+00	2.24E+00	2.72E+00	5.60E-02
Hexane	5.81E+01	6.02E+01	7.63E+01	1.84E-01
o-Xylene	2.64E+01	2.80E+01	4.03E+01	2.71E-01
Propylene	1.42E+02	1.46E+02	1.77E+02	1.80E+00
p-Xylene	0.00E+00	0.00E+00	0.00E+00	5.96E-02
Styrene	1.99E+00	2.15E+00	3.37E+00	4.23E-02
Toluene	1.37E+02	1.44E+02	2.02E+02	1.21E+00
Acrolein	2.15E+00	2.32E+00	3.63E+00	6.34E-03

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Table 2-4. Toxic Air Contaminant Emissions for All Sources – Proposed Project Without Mitigation

Toxic Air Contaminant	70-Year Average Emissions (lb/yr)	40-Year Average Emissions (lb/yr)	Maximum Annual Emissions (lb/yr)	Maximum 1-hr Emissions (lb/hr)
Diesel PM (DPM)	3.50E+04	3.54E+04	4.35E+04	3.89E+01
Arsenic	1.65E+01	1.67E+01	1.90E+01	8.06E-02
Bromine	5.58E-01	5.47E-01	6.05E-01	9.10E-04
Cadmium	1.57E+00	1.58E+00	1.81E+00	8.58E-03
Chlorine	5.42E+01	5.33E+01	5.86E+01	5.67E-02
Chromium VI	8.30E-01	8.39E-01	9.55E-01	4.04E-03
Copper	3.41E+00	3.33E+00	3.69E+00	2.36E-03
Lead	1.92E+01	1.94E+01	2.22E+01	8.42E-02
Manganese	1.72E+01	1.68E+01	1.86E+01	8.81E-03
Mercury	1.90E-01	1.86E-01	2.29E-01	8.93E-02
Nickel	2.07E+00	2.09E+00	2.34E+00	1.42E-02
Selenium	1.55E+00	1.57E+00	1.78E+00	7.74E-03
Sulfates	1.07E+03	1.08E+03	1.21E+03	8.72E+00
Vanadium	1.50E+00	1.46E+00	1.66E+00	1.90E-03
1,3-Butadiene	1.01E+01	1.18E+01	2.05E+01	2.39E-01
Acetal-dehyde	6.68E+00	7.52E+00	1.16E+01	8.35E+00
Benzene	1.02E+02	1.11E+02	1.53E+02	2.39E+00
Chloro- benzene	1.18E+00	1.20E+00	1.36E+00	3.48E-04
Ethyl-benzene	2.16E+01	2.49E+01	4.01E+01	3.93E-01
Form-aldehyde	7.23E+01	7.68E+01	1.01E+02	1.68E+01
Xylenes	8.04E+00	8.14E+00	9.23E+00	2.37E-03
Methanol	2.27E+00	2.64E+00	4.39E+00	3.94E-02
Methyl ethyl ketone (MEK)	3.39E-01	3.95E-01	6.57E-01	1.67E+00
m-Xylene	7.73E+01	8.83E+01	1.41E+02	8.53E-01
Naphthalene	2.53E+00	2.70E+00	3.60E+00	9.98E-02
Hexane	6.83E+01	7.36E+01	1.02E+02	2.60E-01
o-Xylene	3.08E+01	3.47E+01	5.34E+01	4.37E-01
Propylene	2.49E+02	2.59E+02	3.20E+02	3.12E+00
p-Xylene	0.00E+00	0.00E+00	0.00E+00	1.08E-01
Styrene	2.28E+00	2.66E+00	4.42E+00	7.12E-02
Toluene	1.60E+02	1.78E+02	2.67E+02	1.94E+00
Acrolein	2.46E+00	2.86E+00	4.76E+00	5.84E-03

Table 2-5. Toxic Air Contaminant Emissions for All Sources – Proposed Project With Mitigation

Toxic Air Contaminant	70-Year Average Emissions (lb/yr)	40-Year Average Emissions (lb/yr)	Maximum Annual Emissions (lb/yr)	Maximum 1-hr Emissions (lb/hr)
Diesel PM (DPM)	3.00E+04	3.05E+04	3.71E+04	2.92E+01
Arsenic	1.73E+01	1.74E+01	1.91E+01	5.51E-02
Bromine	5.58E-01	5.47E-01	6.05E-01	8.20E-04
Cadmium	1.64E+00	1.65E+00	1.82E+00	6.01E-03
Chlorine	5.42E+01	5.33E+01	5.86E+01	5.49E-02
Chromium VI	8.68E-01	8.76E-01	9.60E-01	2.76E-03
Copper	3.41E+00	3.33E+00	3.69E+00	2.23E-03
Lead	1.92E+01	1.94E+01	2.23E+01	5.80E-02
Manganese	1.72E+01	1.68E+01	1.86E+01	8.61E-03
Mercury	1.90E-01	1.86E-01	2.29E-01	8.91E-02
Nickel	2.07E+00	2.09E+00	2.35E+00	1.17E-02
Selenium	1.55E+00	1.57E+00	1.78E+00	5.32E-03
Sulfates	1.07E+03	1.08E+03	1.21E+03	7.45E+00
Vanadium	1.50E+00	1.46E+00	1.66E+00	1.76E-03
1,3-Butadiene	1.01E+01	1.18E+01	2.05E+01	2.21E-01
Acetal-dehyde	6.68E+00	7.52E+00	1.16E+01	7.64E+00
Benzene	1.06E+02	1.15E+02	1.71E+02	2.20E+00
Chloro- benzene	1.26E+00	1.30E+00	1.77E+00	3.48E-04
Ethyl-benzene	2.17E+01	2.50E+01	4.07E+01	3.63E-01
Form-aldehyde	7.25E+01	7.70E+01	1.01E+02	1.53E+01
Xylenes	8.60E+00	8.82E+00	1.21E+01	2.37E-03
Methanol	2.27E+00	2.64E+00	4.39E+00	3.65E-02
Methyl ethyl ketone (MEK)	3.39E-01	3.95E-01	6.57E-01	1.53E+00
m-Xylene	7.80E+01	8.92E+01	1.45E+02	7.94E-01
Naphthalene	2.65E+00	2.83E+00	4.18E+00	9.16E-02
Hexane	7.09E+01	7.68E+01	1.15E+02	2.45E-01
o-Xylene	3.13E+01	3.53E+01	5.60E+01	4.04E-01
Propylene	2.57E+02	2.68E+02	3.58E+02	2.87E+00
p-Xylene	0.00E+00	0.00E+00	0.00E+00	9.86E-02
Styrene	2.28E+00	2.66E+00	4.42E+00	6.56E-02
Toluene	1.63E+02	1.82E+02	2.85E+02	1.80E+00
Acrolein	2.46E+00	2.86E+00	4.76E+00	5.84E-03

3.0 Dispersion Modeling

The air dispersion modeling for the HRA was performed using the USEPA AERMOD dispersion model, version 09292, 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 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 AERMOD model allows input of multiple sources and source groupings, eliminating the need for multiple model runs. 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,” and “volume” source types. AERMOD is a USEPA-approved dispersion model, and the SCAQMD approves of its use for mobile source analyses.

3.1 Receptor Locations Used in the HRA

Receptor and source base elevations were determined from USGS National Elevation Dataset (NED) data calculated using AERMAP, version 06341. All coordinates were referenced to UTM North American Datum 1927 (NAD27) Zone 11.

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, property line receptors bordering water, and overwater grid receptors were excluded from the analysis.

To refine the locations of maximum impacts, fine receptor grids were placed based on contours generated by maximum incremental impacts, with receptors spaced 50 meters apart out to a distance approximately 500 meters past the maximum impact location.

Maximally exposed individual (MEI) locations were selected from the modeled receptor grids for five receptor types: residential, occupational, sensitive, student and recreational. The MEI locations were selected as follows:

- Residential – The residential MEI was selected from all receptors in residential or zoned-residential areas, including public marinas located in Fish Harbor and the West Channel;
- Occupational – The occupational MEI was selected from all receptors outside the APL terminal area. The valid selection area included all adjacent Port terminals.
- Sensitive – The sensitive MEI was selected from all schools, hospitals, convalescent homes, and day care centers identified in the project vicinity.

- Recreational – The recreational MEI was selected from all on-land park and recreational facilities identified in the project vicinity.

3.2 Emission Source Representation

Construction emission sources were modeled according to the parameters in Table 3-1. All landside combustion emissions from construction equipment were modeled as a single elevated polygon area source. The area source encompassed the entire construction area and emissions were assumed to be uniformly distributed throughout the construction area. Emissions from cargo ship turning and docking for delivery of shoreside wharf cranes were modeled as a single volume source. Emissions from container ship hoteling during crane delivery were modeled as a stationary point source.

Table 3-1. Source Release Parameters – Construction Emissions

AERMOD Source Type	Source Description	No. of Sources Represented	Release Height (m)	Source Width (m)	Initial Vertical Thickness[a] (m)
Elevated Area	Combustion Emissions from Construction Equipment and Vehicle Activity	1	5	Varies[b]	5
Point	Cargo Ship Hoteling	1	37.19	0.39	N/A
Volume	Turning and Docking	1	78.638	300	36.576

Notes:

[a]Release height of the volume source was assumed to be 5 meters above the base elevation of 15 feet. The initial vertical dimension of the plume (σ_z) was estimated by dividing the initial vertical thickness by 4.3 for elevated releases (construction equipment and ship turning/docking).

[b]Area source width varies from approximately 875-2000 meters.

Operational emission sources were modeled according to the parameters in Table 3-2. All ship transit, off-site truck transit, worker commuting and rail sources were modeled as line sources, which were divided into representative volume sources within AERMOD. On-site trucks and cargo handling equipment were modeled as area sources encompassing the project area. Container ship turning, docking, and anchorage locations were modeled as volume sources encompassing an estimated offshore area where these activities are expected to occur. Emissions from container ship hoteling during cargo loading/unloading were modeled as point sources.

Table 3-2.   Source Release Parameters – Operational Emissions

AERMOD Source Type	Source Description	No. of Sources Represented	Release Height (m)	Source Width (m)	Initial Vertical Thickness[a] (ft)
Elevated Area	On-Terminal Trucks	1	5	Varies[c]	3.9
Elevated Area	Trucks – Queuing in at Gate	1	4.572	Varies[c]	15
Elevated Area	Cargo Handling Equipment	1	5	Varies[c]	3.9
Elevated Area	Ocean-Going Vessels Anchorage Spatial Allocation	1	50	Varies[d]	38.1
Line	Rail – Terminal Island to Anaheim St. (Day)	125	5.58	15	8.53
Line	Rail – Terminal Island to	125	14.54	15	22.18

Table 3-2. Source Release Parameters – Operational Emissions

AERMOD Source Type	Source Description	No. of Sources Represented	Release Height (m)	Source Width (m)	Initial Vertical Thickness[a] (ft)
	Anaheim St. (Night)				
Line	On-Dock Rail – Switch Engines (Day)	26	6.64	50	10.14
Line	On-Dock Rail – Switch Engines (Night)	26	13.56	50	20.7
Line	On-Dock Rail – Line Haul (Day)	15	6.64	50	10.14
Line	On-Dock Rail – Line Haul (Night)	15	13.56	50	20.7
Line	Ships – Harbor Transit	14	59.13	100	60.47
Line	Ships – Precautionary Zone (PZ) Transit (All Routes)	53	49.07	300	29.76
Line	Ships – Southern Route PZ to Pt. Fermin	352	49.07	300	29.76
Line	Offsite Trucks	312	4.57	Varies[e]	7
Line	Assist Tugs	14	15.24	100	23.26
Line	Workers – Vincent Thomas Bridge	47	56.39	18	3.48
Line	Workers – Other Route Segments[f,g]	36	4.57	24	7
Volume	Container Ships – Turning and Docking	1	78.638	300	120
Point	Container Ships – Hoteling	1	44.501		N/A

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 2.15 for ground-based releases.

[b]Based on a series of visual observations of containership exhaust plumes at the POLA, the plume height was conservatively assumed to be 25% above stack height for fairway and precautionary area transit, 50% above stack height for harbor transit, and 100% above stack height for turning and docking. The lower apparent wind speeds at slower ship speeds result in a higher plume rise.

[c]Area source width varies from approximately 875 – 2,000 meters.

[d]Area source width varies from approximately 2,000 – 4,000 meters.

[e]Width of representative volume sources varies from 18 – 60 meters.

[f]Width of representative volume srouces varies from 24 to 60 meters.

[g]Other route segments include Highway 47 on Terminal Island between Henry Ford Ave. and Ocean Blvd., Highway 47 North from Anaheim St. to Henry Ford Ave., Highway 47 on Terminal Island, Henry Ford Ave., Interstate 110 from Anaheim St. to Vincent Thomas Bridge, Interstate 710 from Anaheim St. to Highway 47 on Terminal Island, Ocean Blvd. from Terminal to Highway 47/Interstate 110 Split, and Terminal from APL to Ocean Blvd.

3.3 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 (POLA/POLB, 2010).

POLA and POLB currently are operating monitoring programs that include the collection of meteorological data from several locations within port boundaries (Port, 2004). The data sets contain 8,760 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 (POLA/POLB, 2010).

For this health risk evaluation, the meteorological data collected at the Terminal Island Treatment Plant (TITP) was used for dispersion modeling. TITP is located just north of the APL container terminal on Pier 300, less than 1 km from the center of the APL terminal. The data used was collected between September 2006 and August 2007, and was processed and provided by Environ (2009).

The meteorological data were processed using the USEPA's approved AERMET (version 06341) 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.

3.4 Model Options

Technical options selected for the AERMOD model used regulatory defaults. Use of these options follows the USEPA modeling guidance (USEPA, 2009; and 40 CFR, Appendix W; November 2005).

3.5 Temporal Distribution Assumptions

Construction and operational emissions were assumed to occur during the times specified in Table 3-3. Emissions were assumed to be uniformly distributed during these time periods, with the exception of worker commute emissions which were distributed according to the estimated allocation of workers commuting during the specified times. Temporal distribution assumptions are identical for the proposed Project and NEPA Baseline scenarios.

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

Source Description	Proposed Project and NEPA Baseline	CEQA BAseline
All Construction-Related On- and Off-Road Vehicle and Equipment Activity	5 Days per Week	N/A
	8:00 AM – 4:00 PM	
Cargo Ship Hoteling (Construction and Operational)	7 Days per Week	7 Days per Week (Operational Only)
	24 Hours per Day	24 Hours per Day
All Ship Transit (Construction and Operational)	7 Days per Week	7 Days per Week
	8:00 AM – 5:00 AM	8:00 AM – 12:00 PM
Cargo Handling Equipment	7 Days per Week	7 Days per Week
	8:00 AM – 5:00 AM	8:00 AM – 12:00 PM
Rail Sources (Daytime)	7 Days per Week	7 Days per Week
	8:00 AM – 5:00 PM	8:00 AM – 5:00 PM
Rail Sources (Nighttime)	7 Days per Week	7 Days per Week
	5:00 PM – 2:00 AM	5:00 PM – 12:00 PM
All Truck Transit and Idling (Operational)	Mon-Thu: 20 Hours per Day	Mon-Thu: 20 Hours per Day
	8:00 AM – 4:00 AM	8:00 AM – 4:00 AM
	Fri-Sat: 10 Hours per Day	Fri-Sat: 10 Hours per Day
	8:00 AM – 6:00 PM	8:00 AM – 6:00 PM
	Sun: 0 Hours per Day	Sun: 0 Hours per Day
Worker Commuting	7 Days per Week	7 Days per Week
	2:00 – 4:00 AM, 7:00 – 9:00 AM, 5:00 – 6:00 PM	2:00 – 4:00 AM, 7:00 – 9:00 AM, 5:00 – 6:00 PM

Notes: Operating schedules were provided by APL.

4.0 Calculation of Health Risks

As noted in the Introduction above, the HARP model was used to calculate 70-year cancer, 40-year cancer, non-cancer chronic and acute risk values from dispersion values calculated by AERMOD.

4.1 Toxicity Factors

Toxicity factors for each TAC are built into the HARP model to calculate cancer risk and hazard index values These values are provided in Table 4-1.

Table 4-1. Toxicity Factors Used in HRA

Toxic Air Contaminant	CAS Number	Inhalation Cancer Potency Factor (mg/kg-d)$^{-1}$	Chronic Inhalation REL (µg/m^3)	Target Organ for Chronic Exposure[d]	Acute Inhalation REL (µg/m^3)	Target Organ for Acute Exposure[d]
DPM[a]	9901	1.10E+00	5.00E+00	I	--	--
Arsenic[b,c]	7440382	1.20E+01	1.50E-02	B,C,G,I,J	2.00E-01	B,C,G
Bromine	7726956	--	--	--	--	--
Cadmium[c]	7440439	1.50E+01	2.00E-02	M,I	--	--
Chlorine	7782505	--	2.00E-01	I	2.10E+02	D,I
Chromium VI[c]	18540299	5.10E+02	2.00E-01	I	--	--
Copper	7440508	--	--	--	1.00E+02	I
Lead[b]	7439921	4.20E-02	--	--	--	--
Manganese	7439965	--	9.00E-02	G	--	--
Mercury[c]	7439976	--	3.00E-02	C,M,G	6.00E-01	C,G
Nickel[c]	7440020	9.10E-01	5.00E-02	E,I	6.00E+00	F,I
Selenium	7782492	--	2.00E+01	A,B,G	--	--
Sulfates	9960	--	--	--	1.20E+02	I
Vanadium	7440622	--	--	--	3.00E+01	D,I
1,3-Butadiene	106990	6.00E-01	2.00E+01	H	--	--
Acetaldehyde	75070	1.00E-02	1.40E+02	I	4.70E+02	D,I
Benzene	71432	1.00E-01	6.00E+01	C,E,G	1.30E+03	C,E,F,H
Chlorobenzene	108907	--	1.00E+03	A,M,H	--	--
Ethyl Benzene	100414	8.70E-03	2.00E+03	A,C,L,M	--	--
Formaldehyde	50000	2.10E-02	9.00E+00	I	5.50E+01	D
Xylenes	1330207	--	7.00E+02	G,I	2.20E+04	D,I
Methanol	67561	--	4.00E+03	C	2.80E+04	G
MEK	78933	--	--	--	1.30E+04	D,I
m-Xylene	108383	--	7.00E+02	G,I	2.20E+04	D,I
Naphthalene	91203	1.20E-01	9.00E+00	I	--	--
Hexane	110543	--	7.00E+03	G	--	--
o-Xylene	95476	--	7.00E+02	G,I	2.20E+04	D,I
Propylene	115071	--	3.00E+03	I	--	--
p-Xylene	106423	--	7.00E+02	G,I	2.20E+04	D,I
Styrene	100425	--	9.00E+02	G	2.10E+04	D,I
Toluene	108883	--	3.00E+02	C,G,I	3.70E+04	C,D,G,H,I
Acrolein	107028	--	3.50E-01	I	2.50E+00	D,I

[a]DPM = Diesel Particulate Matter. For ICEs only, DPM is considered to be a surrogate for speciated compounds from diesel exhaust, and is assumed to account for combined health effects of diesel exhaust constituents.
[b]Arsenic and lead were also evaluated for cancer risk from oral exposure. The cancer potency factors for arsenic and lead are 1.50E+00 and 8.50E-03 respectively.
[c]Arsenic, cadmium, hexavalent chromium, mercury and selenium were also evaluated for non-cancer chronic effects from oral exposure. The chronic RELs are 3.5E-06, 5.00E-04, 2.00E-02, 1.60E-04 and 5.00E-02 respectively.
[d]Below is the key to non-cancer acute and chronic target organ systems (OEHHA, 2009):

A. Alimentary Tract
B. Cardiovascular System
H. Reproductive System
I. Respiratory System

C. Developmental System
D. Eye
E. Hematologic System
F. Immune System
G. Nervous System
J. Skin
K. Bone
L. Endocrine System
M. Kidney

Cancer risk values are calculated from cancer potency factors, which are TAC-specific factors that assess the probability that an individual will develop cancer by continuously inhaling or ingesting 1 mg/kg-day over a period of 70 years.

Reference exposure levels (RELs) define the level of continuous exposure to a TAC below which the population is likely to avoid developing adverse non-cancer chronic or acute health effects.

4.2 Cancer Burden

The Office of Environmental Health Hazard Assessment defines cancer burden as “an estimate of the number of cancer cases expected from a 70year exposure …” to current estimated emissions (OEHHA, 2003). Whereas cancer risk represents the probability of an individual to develop cancer, cancer burden multiplies the cancer risk by the exposed population to estimate the number of individuals that would be expected to contract cancer. The exposed population is defined as the number of persons within a facility’s zone of impact, which is typically the area within the facility’s one in a million cancer risk isopleths. Consistent with this definition, cancer burden will be calculated only if a project alternative is associated with cancer risks of one in a million or above.

4.3 Exposure Scenarios for Individual Lifetime Cancer Risk

Cancer risk calculations depend directly on the frequency and duration of exposure to TACs. Risk values were calculated based on exposure assumptions in accordance with the OEHHA *HRA Guidance Manu*al (OEHHA, 2003) and *CARB Recommended Interim Risk Management Policy for Inhalation-Based Residential Cancer Risk* (CARB 2004).

Occupational cancer risk values were adjusted by applying factors to the annual average TAC concentrations. These factors adjust for the fraction of the facility’s operating schedule that coincides with a hypothetical worker’s schedule. GLC adjustment factors were obtained from the SCAQMD Permit Application Package “L” for Use in Conjunction with the Risk Assessment Procedures for Rules 1401 and 212, version 7.0 (SCAQMD, 2010) and varied depending on the operating schedule emission source.

Since HARP does not directly calculate student and recreational cancer risk values, these values were scaled using the risk results for occupational or residential receptors by adjusting the exposure assumptions (exposure frequency,exposure duration, and breathing rate). Scaling for student receptors was based on occupational receptors is because student and occupational receptors share common non-inhalation exposure pathways of dermal absorption and soil ingestion. By contrast, residential and sensitive receptors include these same pathways plus home-grown produce ingestion and mother’s milk ingestion. Recreational receptors were scaled to the residential cancer risk impact, due to the similarities in exposure duration.

Exposure assumptions used to calculate cancer risk values are provided in Table 4-2.

Table 4-2. Exposure Assumptions for Individual Lifetime Cancer Risk

Receptor Type	Exposure Frequency		Exposure Duration (years)	Breathing Rate (L/kg-day)	HARP Point Estimate Analysis Option[e]
	Hours/Day	Days/Year			
Residential[a]	24	350	70	302	Derived (Adjusted)
Occupational[b]	8	245	40	447	Derived (OEHHA)
Sensitive	24	350	70	302	n/a
Student[c]	6	180	6	581	n/a
Recreational[d]	2	350	70	1,097	n/a

Notes:

[a]The residential breathing rate of 302 L/kg-day represents the 80[th] percentile breathing rate, in accordance with the *CARB Recommended Interim Risk Management Policy for Inhalation-Based Residential Cancer Risk* (CARB 2004).

[b]The occupational exposure frequency of 245 days/year represents 5 days/week, 49 weeks/year. The occupational breathing rate of 447 L/kg-day is equal to 149 L/kg-day per 8 hour workday (OEHHA, 2003).

[c]The student breathing rate of 583 L/kg-day represents the high-end breathing rate for children (OEHHA, 2003).

[d]The recreational breathing rate of 1,097 L/kg-day represents a breathing rate for "heavy activity." It is derived from a breathing rate of 3.2 m3/hr for a 70-kg adult, as reported from the USEPA Exposure Factors Handbook (USEPA, 1997).

[e]HARP does not directly calculate risks for student or recreational exposure assumptions, rather these values are scaled from the results for workers. Exposure pathways for sensitive receptors are assumed equal to residential receptors.

5.0 Significance Criteria for Project Health Risks

The Port has adopted the significance threshold of 10 in a million as being an acceptable level of cancer risk 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 chances in 1 million (10×10^{-6}).

The Port has also adopted the recently-established 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, 2011).

For chronic and acute non-cancer exposures, maximum predicted annual and 1-hour TAC concentrations are compared with the RELs developed by OEHHA to yield hazard indices. Hazard indexes above 1.0 represent the potential for an unacceptable health effects, and represent CEQA significance criteria for non-cancer effects.

For the determination of significance from a CEQA standpoint, this HRA determined the incremental increase in health effects values due to the proposed Project by estimating the net change in impacts between each proposed Project and Baseline conditions. These incremental health effects values were compared to the significance thresholds described above.

6.0 Predicted Incremental Health Impacts

6.1 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 (Project minus CEQA Baseline) and NEPA incremental impact (Project minus NEPA Baseline).

6.1.1 Unmitigated Impacts

6.1.1.1 CEQA Incremental Impacts

Table 6-1 presents the maximum health impacts expected to occur from the NOP CEQA increment (proposed Project minus NOP CEQA baseline) and future CEQA increment (proposed Project minus future CEQA baseline) without mitigation.

Table 6-2 shows the percent contribution to the future CEQA increment for each modeled source group associated with residential and offsite worker exposure. The NOP CEQA increment was less than zero[1] for cancer and chronic non-cancer impacts, and was the same as the future CEQA increment for acute impacts.

The total (not incremental) residential cancer risk isopleths for the proposed Project, NOP CEQA baseline and future CEQA baseline are presented in Attachment E3.1. The incremental residential lifetime cancer risk isopleths for the unmitigated proposed Project incremental risk above the future CEQA baseline are presented on Figure 6-1. The incremental occupational (offsite worker) cancer risk isopleths for the unmitigated proposed Project incremental risk above the future CEQA baseline are presented on Figure 6-2. Finally, the locations of the maximally exposed individual (MEI) for cancer, chronic non-cancer, and acute incremental impacts are presented in Attachment E3.2.

6.1.1.2 NEPA Incremental Impacts

Table 6-3 presents the maximum health impacts expected to occur from the NEPA increment (proposed Project minus NEPA baseline) without mitigation. Table 6-4 shows the percent contribution to the NEPA increment for each modeled source group associated with residential and offsite worker exposure. The total residential cancer risk isopleths for the NEPA baseline are also presented in Attachment E3.1.

The incremental residential lifetime cancer risk isopleths for the unmitigated proposed Project incremental risk above the NEPA baseline are presented on Figure 6-3. The incremental occupational (offsite worker) cancer risk isopleths for the unmitigated proposed Project incremental risk above the NEPA baseline are presented on Figure 6-4. Finally, the locations of the maximally exposed individual (MEI) for cancer, chronic non-cancer, and acute incremental impacts, without mitigation are also presented in Attachment E3.2.

[1] Incremental impacts can be less than zero if the proposed Project impacts are less than the CEQA or NEPA baseline impacts. Isopleths are not produced for these conditions since the impacts are clearly less than the significance thresholds.

Table 6-1. Maximum Incremental CEQA Health Impacts Associated with Proposed Project Without Mitigation

Health Impact	Receptor Type	Maximum Predicted Impact[a,d]					Significance Threshold
		Proposed Project	NOP CEQA Baseline[h]	NOP CEQA Increment[b,c]	Future CEQA Baseline	Future CEQA Increment[b,c]	
Cancer Risk[f]	Residential[e]	47	130	<0[g]	22	**25×10^{-6} (25 in a million)**	10×10^{-6} (10 in a million)
	Occupational	38	65	<0[g]	22	**16×10^{-6} (16 in a million)**	
	Sensitive	15	60	<0[g]	8	7×10^{-6} (7 in a million)	
	Student	0.6	1.3	<0[g]	0.4	0.2×10^{-6} (0.2 in a million)	
	Recreational	5	16	<0[g]	2	3×10^{-6} (3 in a million)	
Chronic Hazard Index	Residential	0.2	0.5	< 0[g]	0.5	< 0[g]	1.0
	Occupational	0.5	0.8	< 0[g]	0.8	< 0[g]	
	Sensitive	0.1	0.4	< 0[g]	0.4	< 0[g]	
	Student	0.1	0.3	< 0[g]	0.3	< 0[g]	
	Recreational	0.1	0.4	< 0[g]	0.4	< 0[g]	
Acute Hazard Index	Residential	1.4	0.2	**1.2**	0.2	**1.2**	1.0
	Occupational	2.0	0.2	**1.8**	0.2	**1.8**	
	Sensitive	0.4	0.06	0.4	0.06	0.4	
	Student	0.4	0.06	0.4	0.06	0.4	
	Recreational	0.6	0.09	0.5	0.09	0.5	

Notes:

a) Exceedances of the significance criteria are in **bold**. The significance thresholds apply to the CEQA and NEPA increments only.

b) The maximum increments might not necessarily occur at the same receptor locations as the maximum impacts. This means that the increments cannot necessarily be determined by simply subtracting the baseline impacts from the Project impacts. The example given in the text, before the CEQA Impact Determination, illustrates how the increments are calculated.

c) The CEQA increment represents Project minus CEQA baseline.

d) Data represent the receptor locations with the maximum impacts or increments. The impacts or increments at all other receptors would be less than these values.

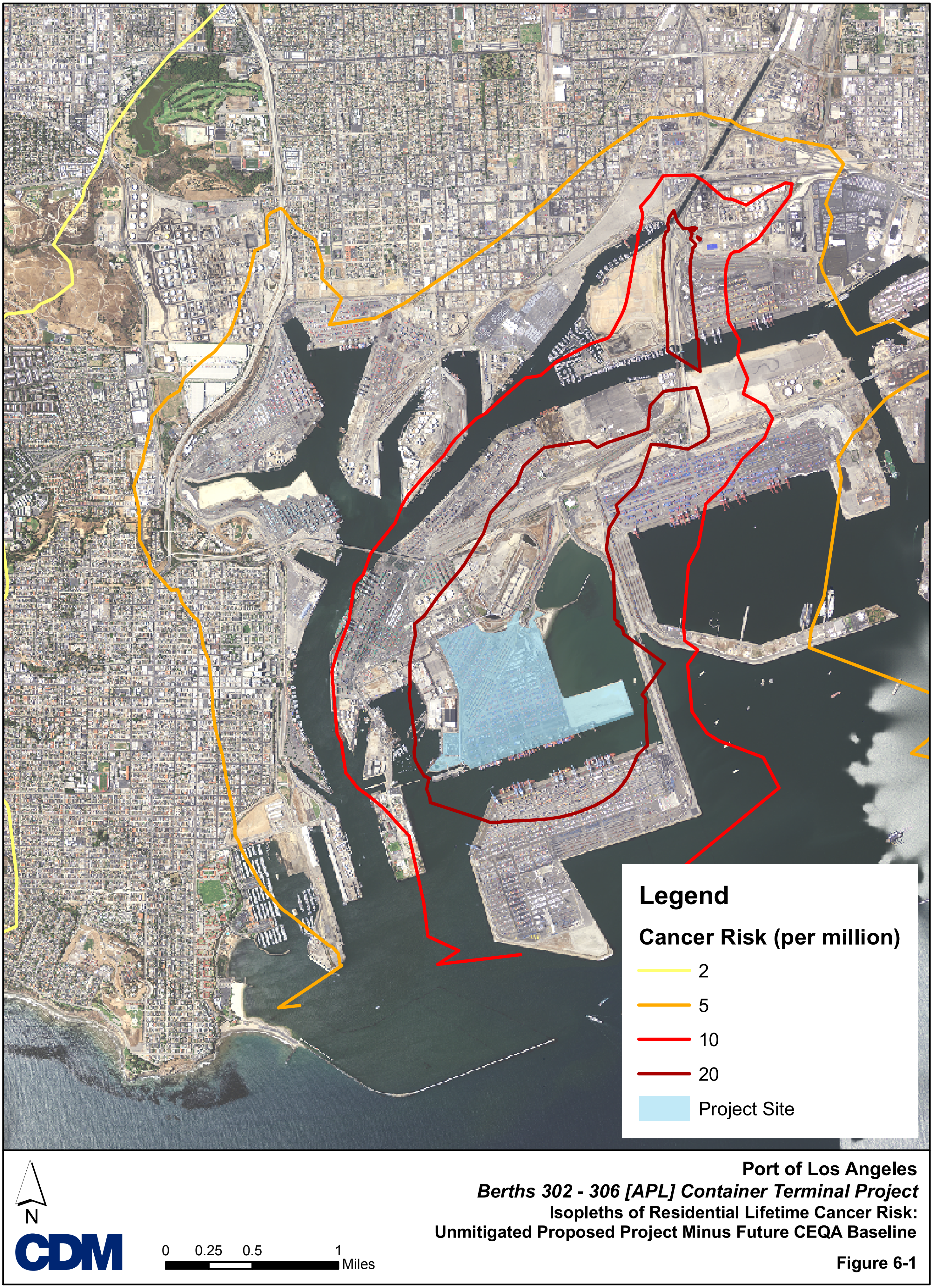
e) The cancer risk values reported in this table for the residential receptor are based on the 80th percentile breathing rate.

f) Construction emissions were modeled with the operational emissions for the determination of cancer risk.

g) When the predicted impact is less than zero, the Project risk is less than the respective baseline.

Table 6-2. Percent Contribution to Total 70-Year and 40-Year Incremental CEQA Cancer Risk at Maximum Exposed Resident and Worker Locations (Proposed Project Without Mitigation)

	Proposed Project minus Future CEQA Baseline	
Source Description	**Resident (70-year)**	**Worker (40-year)**
Container Ships - Hoteling	0.8%	-1.4%
Container Ships - Harbor Transit/Docking/Anchorage	2.5%	4.0%
Container Ships - Precautionary Zone Transit	0.9%	0.4%
Container Ships - 20 nm to Precautionary Zone	0.5%	0.2%
Container Ships - 40 to 20 nm	0.2%	0.1%
Ocean-Going Vessels	**4.9%**	**3.3%**
Assist Tugs in Harbor	**0.3%**	**0.7%**
Rail Locomotives - Line Haul	27.4%	1.3%
Rail Locomotives - On-Dock Switchers	1.3%	3.0%
Rail Locomotives	**28.7%**	**4.3%**
Trucks - On Terminal and Queuing at Gate	1.8%	19.5%
Trucks – Traveling on Near-Port Roadways	59.7%	1.3%
Container Trucks	**61.5%**	**20.8%**
Cargo Handling Equipment	**4.6%**	**70.3%**
Construction Activity	**<0.05%**	**0.6%**
Worker Trips	**<0.05%**	**<0.05%**



Port of Los Angeles

Berths 302 - 306 [APL] Container Terminal Project

Isopleths of Residential Lifetime Cancer Risk:

Unmitigated Proposed Project Minus Future CEQA Baseline

Figure 6-1

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Berths 302 - 306 [APL] Container Terminal Project

Isopleths of Occupational Lifetime Cancer Risk:
Unmitigated Proposed Project Minus Future CEQA Baseline

Figure 6-2

Table 6-3. Maximum Incremental NEPA Health Impacts Associated with Proposed Project Without Mitigation

Health Impact	Receptor Type	Maximum Predicted Impact[a,d]			Significance Threshold
		Proposed Project	**NEPA Baseline**	**NEPA Increment[b,c]**	
Cancer Risk[f]	Residential[e]	47	40	7×10^{-6} (7 in a million)	10×10^{-6} (10 in a million)
	Occupational	38	31	7×10^{-6} (7 in a million)	
	Sensitive	15	13	2×10^{-6} (2 in a million)	
	Student	0.6	0.5	8×10^{-8} (0.08 in a million)	
	Recreational	5.2	4.5	8×10^{-7} (0.8 in a million)	
Chronic Hazard Index	Residential	0.2	0.2	0.06	1.0
	Occupational	0.5	0.4	0.2	
	Sensitive	0.1	0.1	0.03	
	Student	0.1	0.09	0.03	
	Recreational	0.1	0.1	0.04	
Acute Hazard Index	Residential	1.4	0.2	**1.2**	1.0
	Occupational	2.0	0.2	**1.8**	
	Sensitive	0.4	0.06	0.4	
	Student	0.4	0.06	0.4	
	Recreational	0.6	0.09	0.5	

Notes:

a) Exceedances of the significance criteria are in **bold**. The significance thresholds apply to the CEQA and NEPA increments only.

b) The maximum increments might not necessarily occur at the same receptor locations as the maximum impacts. This means that the increments cannot necessarily be determined by simply subtracting the baseline impacts from the Project impacts. The example given in the text, before the CEQA Impact Determination, illustrates how the increments are calculated.

c) The NEPA increment represents Project minus NEPA baseline.

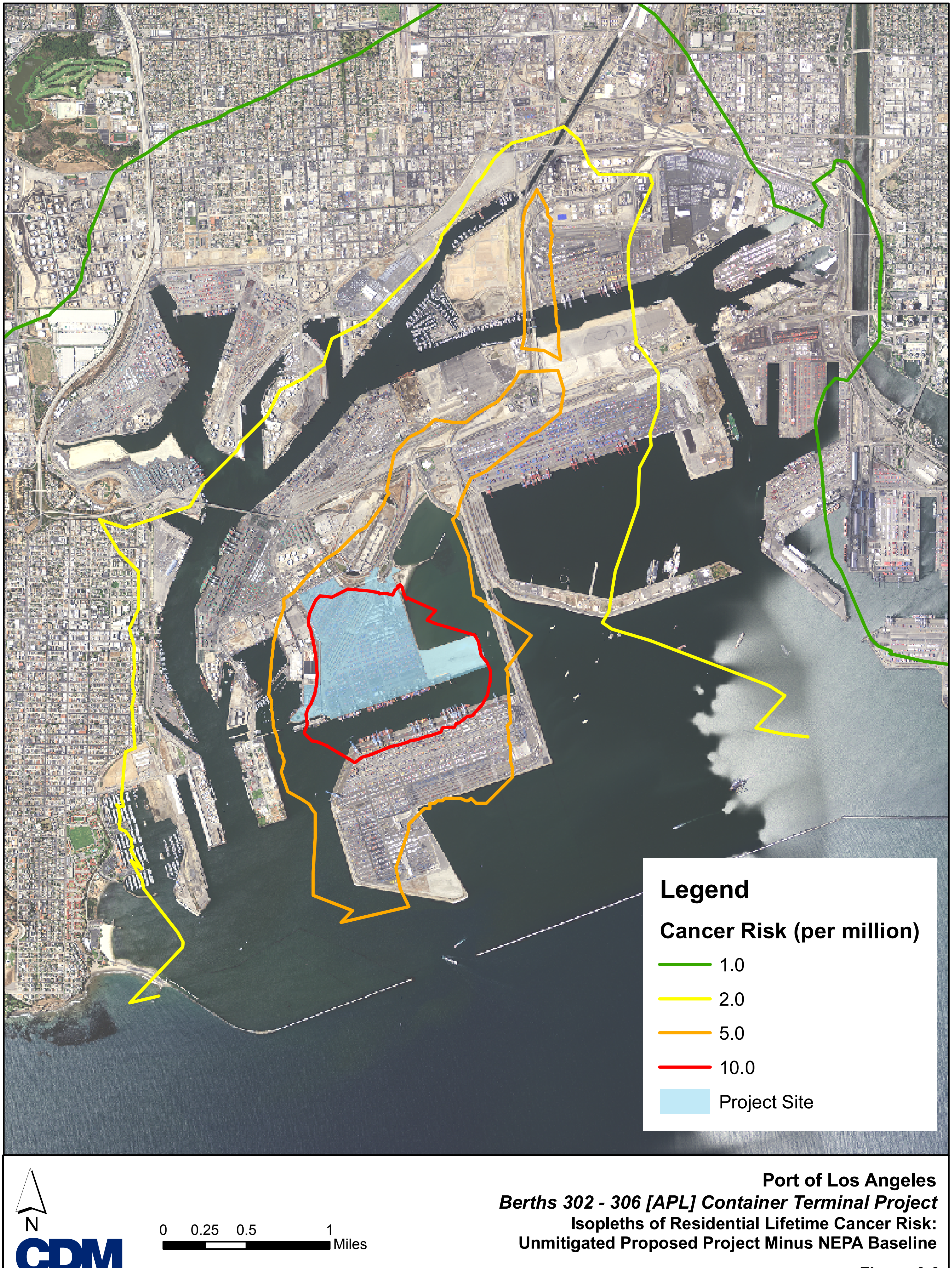
d) Data represent the receptor locations with the maximum impacts or increments. The impacts or increments at all other receptors would be less than these values.

e) The cancer risk values reported in this table for the residential receptor are based on the 80th percentile breathing rate.

f) Construction emissions were modeled with the operational emissions for the determination of cancer risk.

Table 6-4. Percent Contribution to Total 70-Year and 40-Year Incremental Cancer Risk at Maximum Exposed Resident and Worker Locations (Proposed Project Without Mitigation)

	Proposed Project minus NEPA Baseline Increment	
Source Description	**Resident (70-year)**	**Worker (40-year)**
Container Ships - Hoteling	4.1%	1.3%
Container Ships - Harbor Transit	5.1%	6.6%
Container Ships - Precautionary Zone Transit	1.6%	0.6%
Container Ships - 20 nm to Precautionary Zone	0.9%	0.3%
Container Ships - 40 to 20 nm	0.5%	0.1%
Ocean-Going Vessels	**12.1%**	**8.9%**
Assist Tugs in Harbor	**0.6%**	**1.0%**
Rail Locomotives - Terminal Island to Anaheim St.	56.7%	0.5%
Rail Locomotives - On-Dock Switchers	2.7%	1.2%
Rail Locomotives	**59.4%**	**1.7%**
Trucks - On Terminal and Queuing at Gate	0.8%	13.5%
Trucks – Traveling on Near-Port Roadways	22.7%	0.9%
Container Trucks	**23.5%**	**14.4%**
Cargo Handling Equipment	**4.3%**	**72.6%**
Construction, including cargo ship material deliveries	**0.1%**	**1.4%**
Worker Trips	**<0.05%**	**<0.05%**



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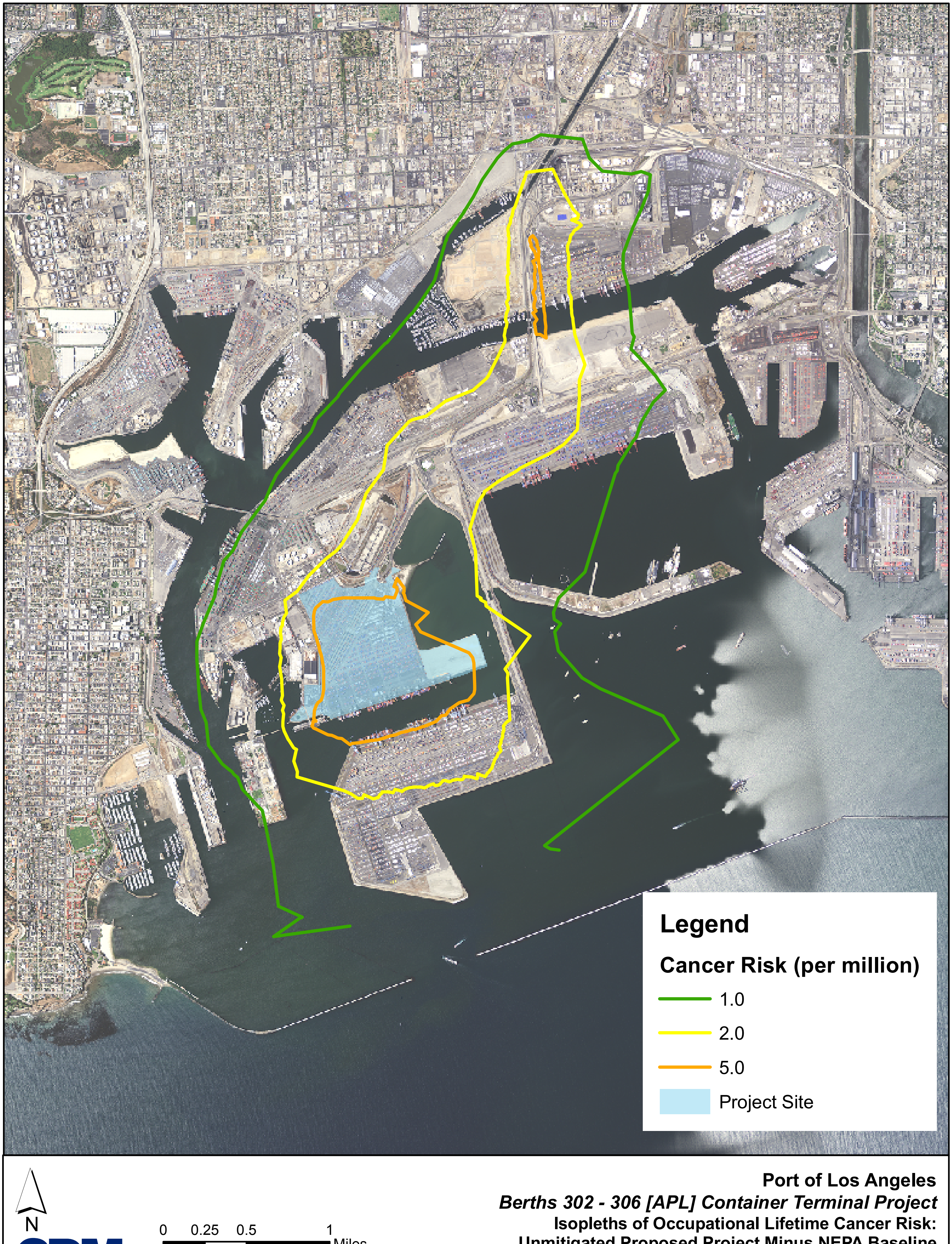
Berths 302 - 306 [APL] Container Terminal Project

Isopleths of Residential Lifetime Cancer Risk: Unmitigated Proposed Project Minus NEPA Baseline

Figure 6-3



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Berths 302 - 306 [APL] Container Terminal Project

Isopleths of Occupational Lifetime Cancer Risk:
Unmitigated Proposed Project Minus NEPA Baseline

Figure 6-4

Based on significance thresholds adopted by the Port, the additional cancer risk above baseline that is expected to result from implementation of the proposed Project is deemed to be less than significant if it is below 10 cases per one million persons. For non-cancer chronic and acute hazard indices, maximum predicted annual and maximum 1-hour TAC concentrations are compared to the RELs developed by OEHHA. The incremental hazard index calculated by the quotient of increased TAC concentrations above baseline and the REL is said to be significant if it exceeds 1.0.

6.1.2 Mitigated Impacts

6.1.2.1 CEQA Incremental Impacts

Table 6-5 presents the maximum health impacts expected to occur from the NOP CEQA increment (proposed Project minus NOP CEQA baseline) and future CEQA increment (proposed Project minus future CEQA baseline) with mitigation.

Table 6-6 shows the percent contribution to the future CEQA increment for each modeled source group associated with residential and offsite worker exposure.

The total (not incremental) residential cancer risk isopleths for the proposed Project with mitigation is also presented in Attachment E3.1. The incremental residential lifetime cancer risk isopleths for the unmitigated proposed Project incremental risk above the future CEQA baseline are presented on Figure 6-5. The incremental occupational (offsite worker) cancer risk isopleths for the unmitigated proposed Project incremental risk above the future CEQA baseline are presented on Figure 6-6. Finally, the locations of the maximally exposed individual (MEI) for cancer, chronic non-cancer, and acute incremental impacts are included in Attachment E3.2.

Finally, the one in one million cancer risk isopleth extends into the areas beyond Port property; therefore, a cancer burden calculation was conducted. The calculation results are summarized in Attachment E3.3, and indicate that the mitigated incremental cancer burden for the proposed Project (0.53) would exceed the significance threshold of 0.5 excess cancer cases.

6.1.2.2 NEPA Incremental Impacts

Table 6-7 presents the maximum health impacts expected to occur from the NEPA increment (proposed Project minus NEPA baseline) without mitigation. Table 6-8 shows the percent contribution to the NEPA increment for each modeled source group associated with residential and offsite worker exposure. The total residential cancer risk isopleths for the NEPA baseline are also presented in Attachment E3.1.

The incremental residential lifetime cancer risk isopleths for the unmitigated proposed Project incremental risk above the NEPA baseline are presented on Figure 6-7. The incremental occupational (offsite worker) cancer risk isopleths for the mitigated proposed Project incremental risk above the NEPA baseline are presented on Figure 6-8. Finally, the locations of the maximally exposed individual (MEI) for cancer, chronic non-cancer, and acute incremental impacts, with mitigation, are also presented in Attachment E3.2.

Finally, the one in one million cancer risk isopleth does not extend into landside residential areas; therefore, the incremental cancer burden would be less than the 0.5 excess cancer case threshold.

Table 6-5. Maximum Incremental CEQA Health Impacts Associated with Proposed Project With Mitigation

Health Impact	Receptor Type	Maximum Predicted Impact[a,d]					Significance Threshold
		Proposed Project	NOP CEQA Baseline[h]	NOP CEQA Increment[b,c]	Future CEQA Baseline	Future CEQA Increment[b,c]	
Cancer Risk[f]	Residential[e]	45	130	<0[g]	22	**23×10^{-6} (23 in a million)**	10×10^{-6} (10 in a million)
	Occupational	29	65	<0[g]	18	**11×10^{-6} (11 in a million)**	
	Sensitive	13	60	<0[g]	8	5×10^{-6} (5 in a million)	
	Student	0.4	1.3	<0[g]	0.3	0.1×10^{-6} (0.1 in a million)	
	Recreational	1.7	16	<0[g]	0.8	1×10^{-6} (1 in a million)	
Chronic Hazard Index	Residential	0.2	0.5	< 0[g]	0.5	< 0[g]	1.0
	Occupational	0.3	0.4	< 0[g]	0.4	< 0[g]	
	Sensitive	0.1	0.4	< 0[g]	0.4	< 0[g]	
	Student	0.1	0.3	< 0[g]	0.3	< 0[g]	
	Recreational	0.1	0.4	< 0[g]	0.4	< 0[g]	
Acute Hazard Index	Residential	1.0	0.2	0.9	0.2	0.9	1.0
	Occupational	1.3	0.2	**1.1**	0.2	**1.1**	
	Sensitive	0.3	0.06	0.3	0.06	0.3	
	Student	0.3	0.06	0.3	0.06	0.3	
	Recreational	0.4	0.09	0.4	0.09	0.4	

Notes:

a) Exceedances of the significance criteria are in **bold**. The significance thresholds apply to the CEQA and NEPA increments only.

b) The maximum increments might not necessarily occur at the same receptor locations as the maximum impacts. This means that the increments cannot necessarily be determined by simply subtracting the baseline impacts from the Project impacts. The example given in the text, before the CEQA Impact Determination, illustrates how the increments are calculated.

c) The CEQA increment represents Project minus CEQA baseline.

d) Data represent the receptor locations with the maximum impacts or increments. The impacts or increments at all other receptors would be less than these values.

e) The cancer risk values reported in this table for the residential receptor are based on the 80th percentile breathing rate.

f) Construction emissions were modeled with the operational emissions for the determination of cancer risk.

g) When the predicted impact is less than zero, the Project risk is less than the respective baseline.

Table 6-6. Percent Contribution to Total 70-Year and 40-Year Incremental CEQA Cancer Risk at Maximum Exposed Resident and Worker Locations (Proposed Project With Mitigation)

	Proposed Project minus Future CEQA Baseline	
Source Description	**Resident (70-year)**	**Worker (40-year)**
Container Ships - Hoteling	-2.4%	-6.9%
Container Ships - Harbor Transit/Docking/Anchorage	2.6%	8.3%
Container Ships - Precautionary Zone Transit	1.0%	0.9%
Container Ships - 20 nm to Precautionary Zone	0.5%	0.3%
Container Ships - 40 to 20 nm	0.1%	0.1%
Ocean-Going Vessels	**1.8%**	**2.7%**
Assist Tugs in Harbor	**0.4%**	**1.5%**
Rail Locomotives - Line Haul	28.2%	2.3%
Rail Locomotives - On-Dock Switchers	2.3%	6.7%
Rail Locomotives	**30.5%**	**9.0%**
Trucks - On Terminal and Queuing at Gate	1.9%	40.9%
Trucks – Traveling on Near-Port Roadways	63.3%	2.8%
Container Trucks	**65.2%**	**43.7%**
Cargo Handling Equipment	**2.0%**	**41.9%**
Construction Activity	**<0.05%**	**1.2%**
Worker Trips	**<0.05%**	**<0.05%**

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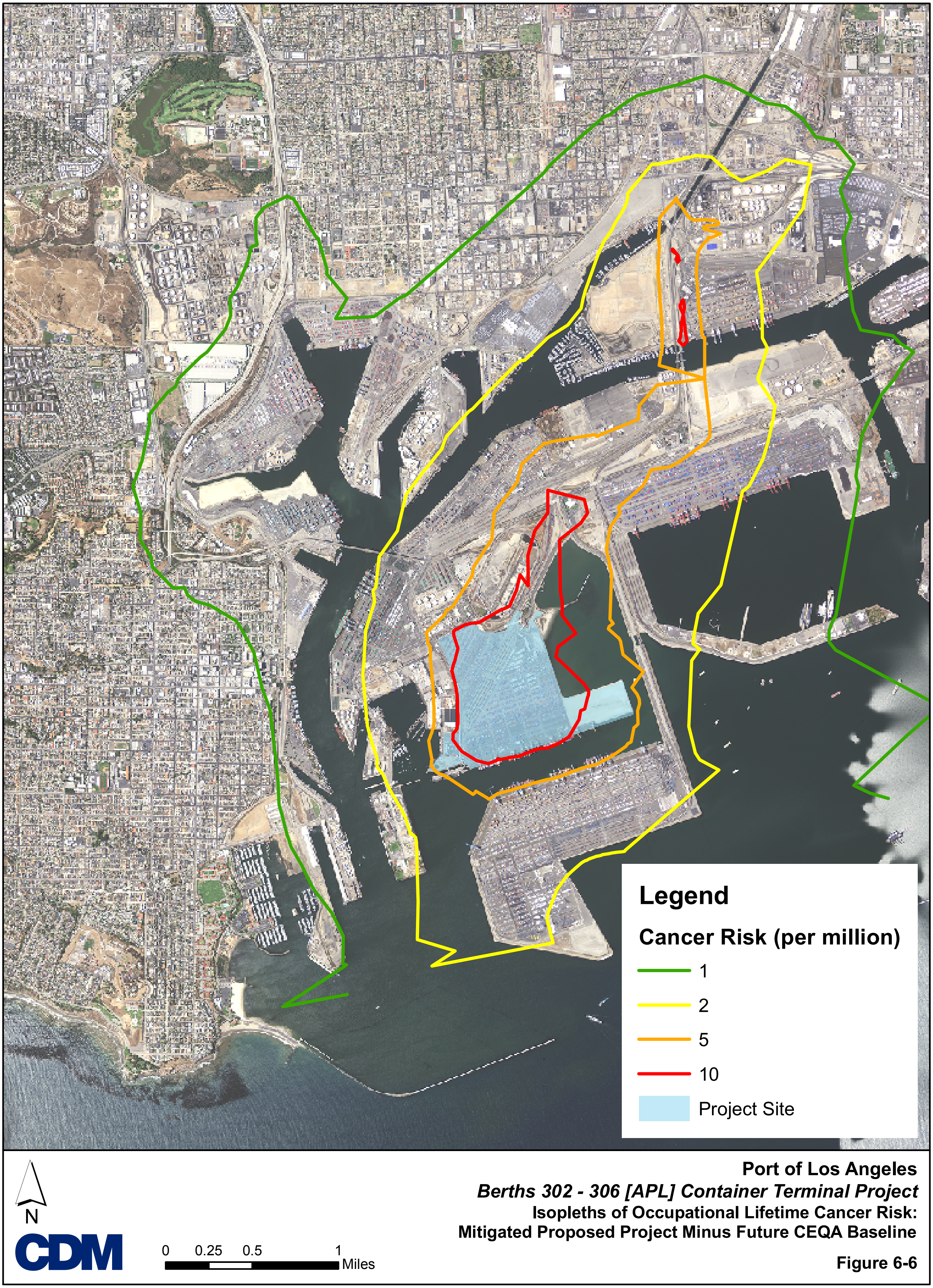
Berths 302 - 306 [APL] Container Terminal Project

Isopleths of Residential Lifetime Cancer Risk:
Mitigated Proposed Project Minus Future CEQA Baseline

Figure 6-5



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Port of Los Angeles
Berths 302 - 306 [APL] Container Terminal Project
Isopleths of Occupational Lifetime Cancer Risk:
Mitigated Proposed Project Minus Future CEQA Baseline

Figure 6-6

Table 6-7. Maximum Incremental NEPA Health Impacts Associated with Proposed Project With Mitigation

Health Impact	Receptor Type	Maximum Predicted Impact[a,d]			Significance Threshold
		Proposed Project	**NEPA Baseline**	**NEPA Increment[b,c]**	
Cancer Risk[f]	Residential[e]	45	40	6×10^{-6} (6 in a million)	10×10^{-6} (10 in a million)
	Occupational	29	23	6×10^{-6} (6 in a million)	
	Sensitive	9.7	9.1	0.6×10^{-6} (0.6 in a million)	
	Student	0.4	0.3	0.05×10^{-6} (0.05 in a million)	
	Recreational	1.7	1.6	0.2×10^{-6} (0.2 in a million)	
Chronic Hazard Index	Residential	0.2	0.2	0.04	1.0
	Occupational	0.3	0.2	0.1	
	Sensitive	0.1	0.1	0.03	
	Student	0.1	0.1	0.02	
	Recreational	0.1	0.1	0.03	
Acute Hazard Index	Residential	1.0	0.2	0.9	1.0
	Occupational	1.3	0.2	**1.1**	
	Sensitive	0.3	0.1	0.3	
	Student	0.3	0.1	0.3	
	Recreational	0.4	0.1	0.4	

Notes:

a) Exceedances of the significance criteria are in **bold**. The significance thresholds apply to the CEQA and NEPA increments only.

b) The maximum increments might not necessarily occur at the same receptor locations as the maximum impacts. This means that the increments cannot necessarily be determined by simply subtracting the baseline impacts from the Project impacts. The example given in the text, before the CEQA Impact Determination, illustrates how the increments are calculated.

c) The NEPA increment represents Project minus NEPA baseline.

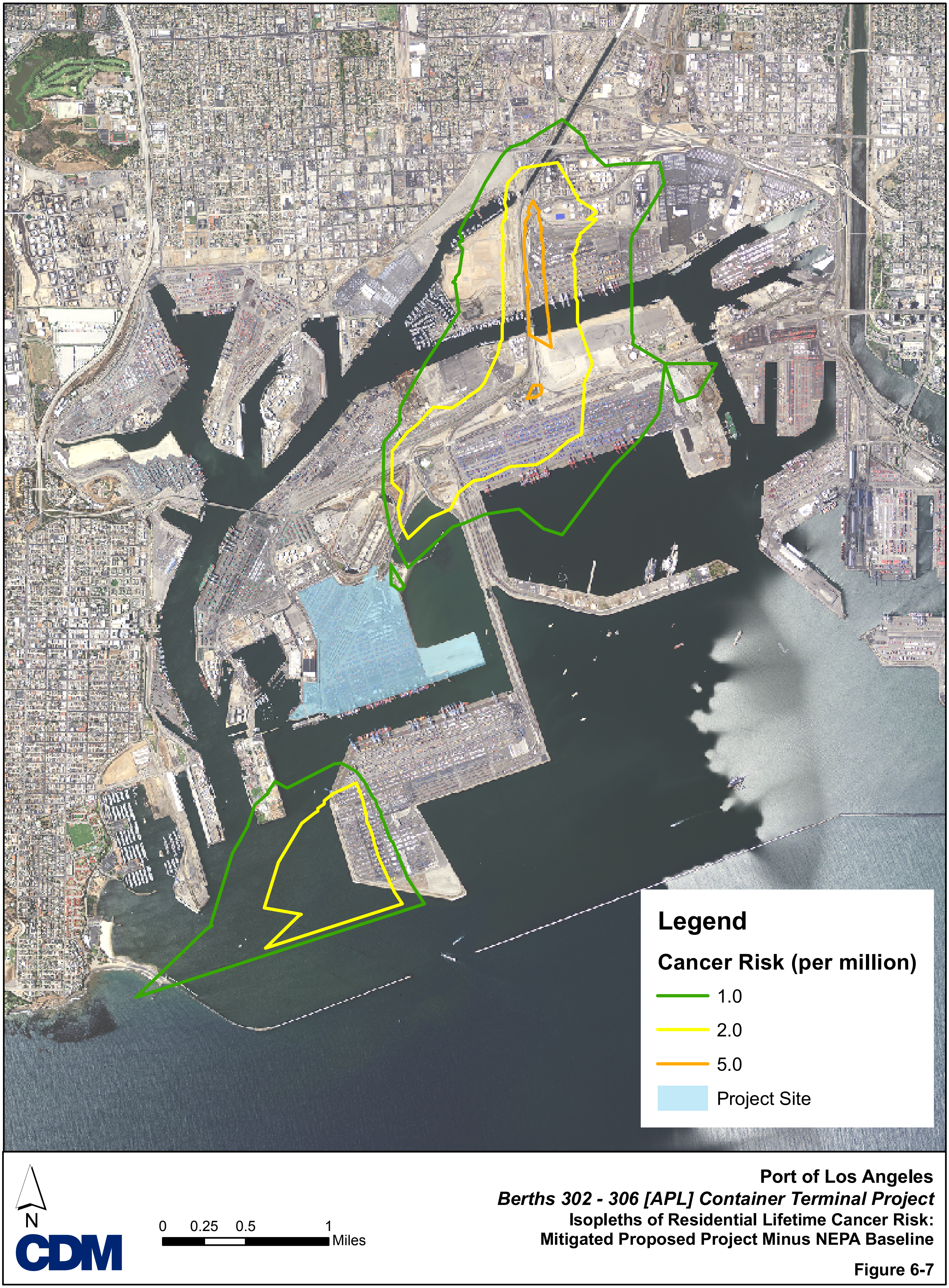
d) Data represent the receptor locations with the maximum impacts or increments. The impacts or increments at all other receptors would be less than these values.

e) The cancer risk values reported in this table for the residential receptor are based on the 80th percentile breathing rate.

f) Construction emissions were modeled with the operational emissions for the determination of cancer risk.

Table 6-8. Percent Contribution to Total 70-Year and 40-Year Incremental NEPA Cancer Risk at Maximum Exposed Resident and Worker Locations (Proposed Project With Mitigation)

Source Description	Proposed Project minus NEPA Baseline Increment	
	Resident	Worker
Container Ships - Hoteling	-8.0%	-2.2%
Container Ships - Harbor Transit/Docking/Anchorage	6.4%	2.8%
Container Ships - Precautionary Zone Transit	2.2%	1.0%
Container Ships - 20 nm to Precautionary Zone	1.1%	0.5%
Container Ships - 40 to 20 nm	0.1%	<0.05%
Ocean-Going Vessels	**1.8%**	**2.1%**
Assist Tugs in Harbor	**0.7%**	**0.3%**
Rail Locomotives - Line Haul	74.3%	68.7%
Rail Locomotives - On-Dock Switchers	0.0%	0.0%
Rail Locomotives	**74.3%**	**68.7%**
Trucks - On Terminal and Queuing at Gate	1.0%	0.7%
Trucks – Traveling on Near-Port Roadways	28.3%	29.3%
Container Trucks	**29.3%**	**30.0%**
Cargo Handling Equipment	**-6.2%**	**-1.2%**
Construction	**0.2%**	**0.1%**
Worker Trips	**<0.05%**	**<0.05%**



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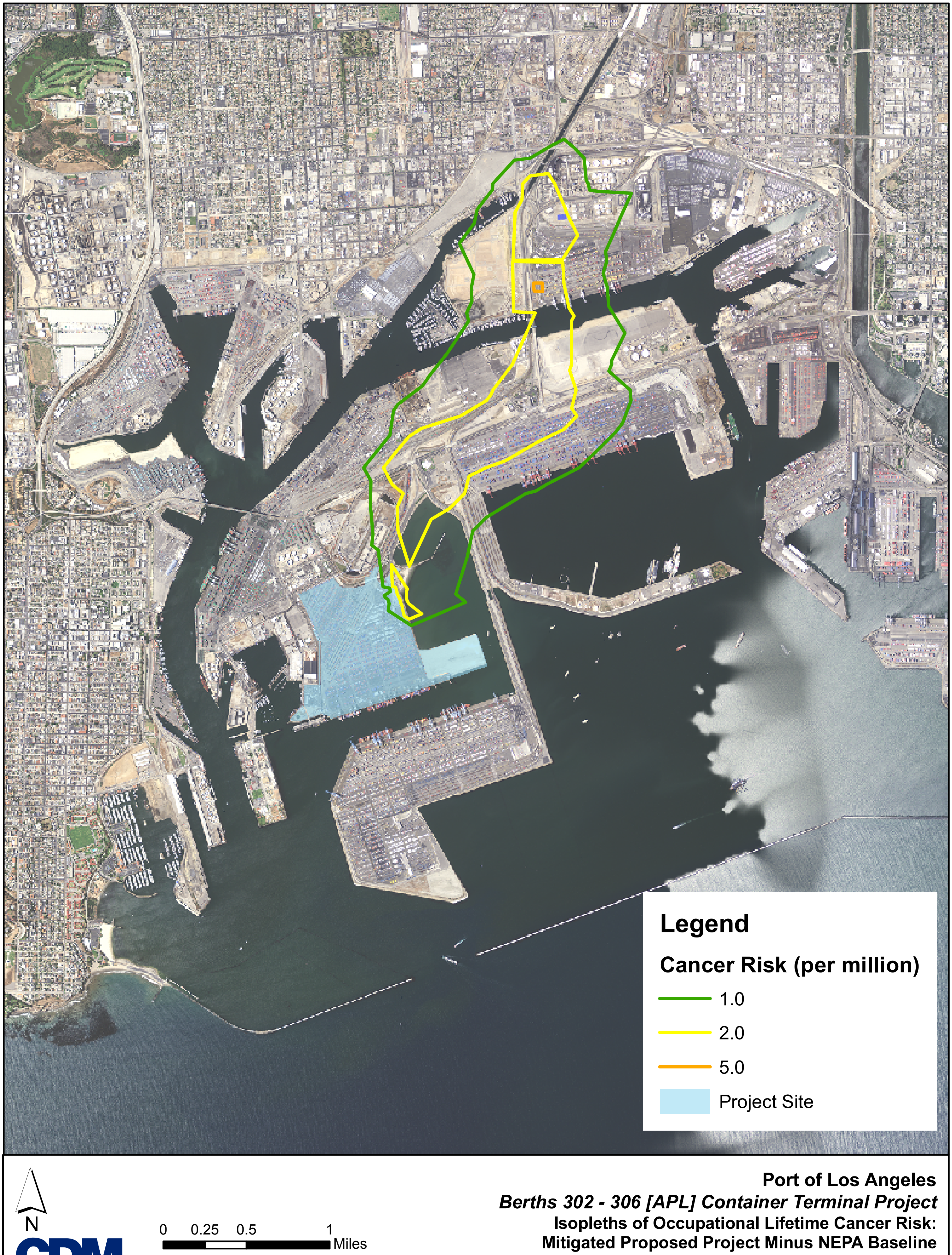
Berths 302 - 306 [APL] Container Terminal Project
Isopleths of Residential Lifetime Cancer Risk:
Mitigated Proposed Project Minus NEPA Baseline

Figure 6-7



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Berths 302 - 306 [APL] Container Terminal Project

Isopleths of Occupational Lifetime Cancer Risk: Mitigated Proposed Project Minus NEPA Baseline

Figure 6-8

6.2 Alternatives

The following discussion presents the health risk assessment impacts for Alternatives 1 through 6. Since the NOP CEQA baseline risks were substantially greater than the proposed Project impacts discussed previously, it is obvious that the incremental risks for these alternatives compared to the NOP CEQA baseline will be less than zero as well. Therefore, the analysis of the alternatives only compares each alternative to the future CEQA baseline and to the NEPA baseline.

6.2.1 Unmitigated Impacts

6.2.1.1 Alternative 1

The emissions for Alternative 1 are essentially identical to those for the NEPA Baseline. Table 6-9 provides the health risk impacts associated with Alternative 1.

Table 6-9. Maximum Incremental CEQA and NEPA Health Impacts Associated with Alternative 1 Without Mitigation

Health Impact	Receptor Type	Maximum Predicted Impact[a,d]					Significance Threshold
		Alt 1	Future CEQA Baseline	Future CEQA Increment[b,c]	NEPA Baseline	NEPA Increment[b,c]	
Cancer Risk[f]	Residential[e]	40	22	**18×10^{-6} (18 in a million)**	40	0	10×10^{-6} (10 in a million)
	Occupational	31	22	9×10^{-6} (9 in a million)	31	0	
	Sensitive	13	8	5×10^{-6} (5 in a million)	13	0	
	Student	0.5	0.4	0.1×10^{-6} (0.1 in a million)	0.5	0	
	Recreational	5	2	3×10^{-6} (3 in a million)	5	0	
Chronic Hazard Index	Residential	0.2	0.5	< 0[g]	0.2	0	1.0
	Occupational	0.4	0.8	< 0[g]	0.4	0	
	Sensitive	0.1	0.4	< 0[g]	0.1	0	
	Student	0.09	0.3	< 0[g]	0.09	0	
	Recreational	0.1	0.4	< 0[g]	0.1	0	
Acute Hazard Index	Residential	0.2	0.2	0	0.2	0	1.0
	Occupational	0.2	0.2	0	0.2	0	
	Sensitive	0.06	0.06	0	0.06	0	
	Student	0.06	0.06	0	0.06	0	
	Recreational	0.09	0.09	0	0.09	0	

Notes:

a) Exceedances of the significance criteria are in **bold**. The significance thresholds apply to the CEQA and NEPA increments only.

b) The maximum increments might not necessarily occur at the same receptor locations as the maximum impacts. This means that the increments cannot necessarily be determined by simply subtracting the baseline impacts from the alternative impacts,

c) The CEQA increment represents Alternative minus CEQA baseline. The NEPA increment represents Alternative minus NEPA baseline.

d) Data represent the receptor locations with the maximum impacts or increments. The impacts or increments at all other receptors would be less than these values.

e) The cancer risk values reported in this table for the residential receptor are based on the 80th percentile breathing rate.

f) Construction emissions were modeled with the operational emissions for the determination of cancer risk.

g) When the predicted impact is less than zero, the Alternative risk is less than the respective baseline.

6.2.1.2 Alternative 2

The emissions for Alternative 2 (NEPA Baseline) are presented in Section 2. Table 6-10 provides the health risk impacts associated with Alternative 1.

Table 6-10. Maximum Incremental CEQA and NEPA Health Impacts Associated with Alternative 2 Without Mitigation

Health Impact	Receptor Type	Maximum Predicted Impact[a,d]					Significance Threshold
		Alt 2	Future CEQA Baseline	Future CEQA Increment[b,c]	NEPA Baseline	NEPA Increment[b,c]	
Cancer Risk[f]	Residential[e]	40	22	**18×10^{-6} (18 in a million)**	40	-	10×10^{-6} (10 in a million)
	Occupational	31	22	9×10^{-6} (9 in a million)	31	-	
	Sensitive	13	8	5×10^{-6} (5 in a million)	13	-	
	Student	0.5	0.4	0.1×10^{-6} (0.1 in a million)	0.5	-	
	Recreational	5	2	3×10^{-6} (3 in a million)	5	-	
Chronic Hazard Index	Residential	0.2	0.5	< 0[g]	0.2	-	1.0
	Occupational	0.4	0.8	< 0[g]	0.4	-	
	Sensitive	0.1	0.4	< 0[g]	0.1	-	
	Student	0.09	0.3	< 0[g]	0.09	-	
	Recreational	0.1	0.4	< 0[g]	0.1	-	
Acute Hazard Index	Residential	0.2	0.2	0	0.2	-	1.0
	Occupational	0.2	0.2	0	0.2	-	
	Sensitive	0.06	0.06	0	0.06	-	
	Student	0.06	0.06	0	0.06	-	
	Recreational	0.09	0.09	0	0.09	-	

Notes:

a) Exceedances of the significance criteria are in **bold**. The significance thresholds apply to the CEQA and NEPA increments only.

b) The maximum increments might not necessarily occur at the same receptor locations as the maximum impacts. This means that the increments cannot necessarily be determined by simply subtracting the baseline impacts from the alternative impacts.

c) The CEQA increment represents Alternative minus CEQA baseline. Alternative 2 and the NEPA Baseline are the same; therefore, no incremental risk is reported for the NEPA increment.

d) Data represent the receptor locations with the maximum impacts or increments. The impacts or increments at all other receptors would be less than these values.

e) The cancer risk values reported in this table for the residential receptor are based on the 80th percentile breathing rate.

f) Construction emissions were modeled with the operational emissions for the determination of cancer risk.

g) When the predicted impact is less than zero, the Alternative risk is less than the respective baseline.

6.2.1.3 Alternative 3

Table 6-11 provides the health risk impacts associated with Alternative 3, unmitigated.

Table 6-11. Maximum Incremental CEQA and NEPA Health Impacts Associated with Alternative 3 Without Mitigation

Health Impact	Receptor Type	Maximum Predicted Impact[a,d]					Significance Threshold
		Alt 3	Future CEQA Baseline	Future CEQA Increment[b,c]	NEPA Baseline	NEPA Increment[b,c]	
Cancer Risk[f]	Residential[e]	44	22	**22×10^{-6} (22 in a million)**	40	4×10^{-6} (4 in a million)	10×10^{-6} (10 in a million)
	Occupational	36	22	**14×10^{-6} (14 in a million)**	31	5×10^{-6} (6 in a million)	
	Sensitive	15	8	5×10^{-6} (5 in a million)	13	2×10^{-6} (2 in a million)	
	Student	0.6	0.4	0.1×10^{-6} (0.1 in a million)	0.5	0.1×10^{-6} (0.1 in a million)	
	Recreational	5	2	3×10^{-6} (3 in a million)	5	0.7×10^{-6} (0.7 in a million)	
Chronic Hazard Index	Residential	0.3	0.5	< 0 [g]	0.2	0.1	1.0
	Occupational	0.6	0.8	< 0 [g]	0.4	0.2	
	Sensitive	0.1	0.4	< 0 [g]	0.1	0.0	
	Student	0.09	0.3	< 0 [g]	0.09	0.0	
	Recreational	0.1	0.4	< 0 [g]	0.1	0.0	
Acute Hazard Index	Residential	1.3	0.2	**1.1**	0.2	**1.1**	1.0
	Occupational	1.9	0.2	**1.7**	0.2	**1.7**	
	Sensitive	0.5	0.06	0.4	0.06	0.4	
	Student	0.5	0.06	0.4	0.06	0.4	
	Recreational	0.6	0.09	0.5	0.09	0.5	

Notes:

a) Exceedances of the significance criteria are in **bold**. The significance thresholds apply to the CEQA and NEPA increments only.

b) The maximum increments might not necessarily occur at the same receptor locations as the maximum impacts. This means that the increments cannot necessarily be determined by simply subtracting the baseline impacts from the alternative impacts.

c) The CEQA increment represents Alternative minus CEQA baseline. The NEPA increment represents Alternative minus NEPA baseline

d) Data represent the receptor locations with the maximum impacts or increments. The impacts or increments at all other receptors would be less than these values.

e) The cancer risk values reported in this table for the residential receptor are based on the 80th percentile breathing rate.

f) Construction emissions were modeled with the operational emissions for the determination of cancer risk.

g) When the predicted impact is less than zero, the Alternative risk is less than the respective baseline.

6.2.1.4 Alternative 4

Table 6-12 provides the health risk impacts associated with Alternative 4, unmitigated.

Table 6-12. Maximum Incremental CEQA and NEPA Health Impacts Associated with Alternative 4 Without Mitigation

Health Impact	Receptor Type	Maximum Predicted Impact[a,d]					Significance Threshold
		Alt 4	Future CEQA Baseline	Future CEQA Increment[b,c]	NEPA Baseline	NEPA Increment[b,c]	
Cancer Risk[f]	Residential[e]	45	22	**23 x 10^{-6} (22 in a million)**	40	5 x 10^{-6} (5 in a million)	10 x 10^{-6} (10 in a million)
	Occupational	37	22	**15 x 10^{-6} (15 in a million)**	31	6 x 10^{-6} (6 in a million)	
	Sensitive	15	8	5 x 10^{-6} (5 in a million)	13	2 x 10^{-6} (2 in a million)	
	Student	0.6	0.4	0.1 x 10^{-6} (0.1 in a million)	0.5	0.2 x 10^{-6} (0.1 in a million)	
	Recreational	5	2	3 x 10^{-6} (3 in a million)	5	0.8 x 10^{-6} (0.7 in a million)	
Chronic Hazard Index	Residential	0.3	0.5	< 0 [g]	0.2	0.1	1.0
	Occupational	0.6	0.8	< 0 [g]	0.4	0.2	
	Sensitive	0.1	0.4	< 0 [g]	0.1	0.0	
	Student	0.09	0.3	< 0 [g]	0.09	0.0	
	Recreational	0.1	0.4	< 0 [g]	0.1	0.0	
Acute Hazard Index	Residential	1.3	0.2	**1.1**	0.2	**1.1**	1.0
	Occupational	1.9	0.2	**1.7**	0.2	**1.7**	
	Sensitive	0.5	0.06	0.4	0.06	0.4	
	Student	0.5	0.06	0.4	0.06	0.4	
	Recreational	0.6	0.09	0.5	0.09	0.5	

Notes:

a) Exceedances of the significance criteria are in **bold**. The significance thresholds apply to the CEQA and NEPA increments only.

b) The maximum increments might not necessarily occur at the same receptor locations as the maximum impacts. This means that the increments cannot necessarily be determined by simply subtracting the baseline impacts from the alternative impacts.

c) The CEQA increment represents Alternative minus CEQA baseline. The NEPA increment represents Alternative minus NEPA baseline.

d) Data represent the receptor locations with the maximum impacts or increments. The impacts or increments at all other receptors would be less than these values.

e) The cancer risk values reported in this table for the residential receptor are based on the 80th percentile breathing rate.

f) Construction emissions were modeled with the operational emissions for the determination of cancer risk.

g) When the predicted impact is less than zero, the Alternative risk is less than the respective baseline.

6.2.1.5 Alternative 5

Table 6-13 provides the health risk impacts associated with Alternative 5, unmitigated.

Table 6-13. Maximum Incremental CEQA and NEPA Health Impacts Associated with Alternative 5 Without Mitigation

Health Impact	Receptor Type	Maximum Predicted Impact[a,d]					Significance Threshold
		Alt 5	Future CEQA Baseline	Future CEQA Increment[b,c]	NEPA Baseline	NEPA Increment[b,c]	
Cancer Risk[f]	Residential[e]	47	22	**25×10^{-6} (25 in a million)**	40	7×10^{-6} (7 in a million)	10×10^{-6} (10 in a million)
	Occupational	38	22	**16×10^{-6} (16 in a million)**	31	7×10^{-6} (7 in a million)	
	Sensitive	15	8	7×10^{-6} (7 in a million)	13	2×10^{-6} (2 in a million)	
	Student	0.6	0.4	0.2×10^{-6} (0.2 in a million)	0.5	8×10^{-8} (0.08 in a million)	
	Recreational	5	2	3×10^{-6} (3 in a million)	5	8×10^{-7} (0.8 in a million)	
Chronic Hazard Index	Residential	0.2	0.5	< 0 [g]	0.2	0.06	1.0
	Occupational	0.5	0.8	< 0 [g]	0.4	0.2	
	Sensitive	0.1	0.4	< 0 [g]	0.1	0.03	
	Student	0.1	0.3	< 0 [g]	0.09	0.03	
	Recreational	0.1	0.4	< 0 [g]	0.1	0.04	
Acute Hazard Index	Residential	1.4	0.2	**1.2**	0.2	**1.2**	1.0
	Occupational	2.0	0.2	**1.8**	0.2	**1.8**	
	Sensitive	0.4	0.06	0.4	0.06	0.4	
	Student	0.4	0.06	0.4	0.06	0.4	
	Recreational	0.6	0.09	0.5	0.09	0.5	

Notes:

a) Exceedances of the significance criteria are in **bold**. The significance thresholds apply to the CEQA and NEPA increments only.

b) The maximum increments might not necessarily occur at the same receptor locations as the maximum impacts. This means that the increments cannot necessarily be determined by simply subtracting the baseline impacts from the alternative impacts.

c) The CEQA increment represents Alternative minus CEQA baseline. The NEPA increment represents Alternative minus NEPA baseline.

d) Data represent the receptor locations with the maximum impacts or increments. The impacts or increments at all other receptors would be less than these values.

e) The cancer risk values reported in this table for the residential receptor are based on the 80th percentile breathing rate.

f) Construction emissions were modeled with the operational emissions for the determination of cancer risk.

g) When the predicted impact is less than zero, the Alternative risk is less than the respective baseline.

6.2.1.6 Alternative 6

Table 6-14 provides the health risk impacts associated with Alternative 6, unmitigated.

Table 6-14. Maximum Incremental CEQA and NEPA Health Impacts Associated with Alternative 6 Without Mitigation

Health Impact	**Receptor Type**	**Maximum Predicted Impact[a,d]**					**Significance Threshold**
		Alt 6	**Future CEQA Baseline**	**Future CEQA Increment[b,c]**	**NEPA Baseline**	**NEPA Increment[b,c]**	
Cancer Risk[f]	Residential[e]	47	22	**25×10^{-6} (25 in a million)**	40	7×10^{-6} (7 in a million)	10×10^{-6} (10 in a million)
	Occupational	38	22	**16×10^{-6} (16 in a million)**	31	7×10^{-6} (7 in a million)	
	Sensitive	15	8	7×10^{-6} (7 in a million)	13	2×10^{-6} (2 in a million)	
	Student	0.6	0.4	0.2×10^{-6} (0.2 in a million)	0.5	8×10^{-8} (0.08 in a million)	
	Recreational	5	2	3×10^{-6} (3 in a million)	5	8×10^{-7} (0.8 in a million)	
Chronic Hazard Index	Residential	0.2	0.5	< 0 [g]	0.2	0.06	1.0
	Occupational	0.5	0.8	< 0 [g]	0.4	0.2	
	Sensitive	0.1	0.4	< 0 [g]	0.1	0.03	
	Student	0.1	0.3	< 0 [g]	0.09	0.03	
	Recreational	0.1	0.4	< 0 [g]	0.1	0.04	
Acute Hazard Index	Residential	1.4	0.2	**1.2**	0.2	**1.2**	1.0
	Occupational	2.0	0.2	**1.8**	0.2	**1.8**	
	Sensitive	0.4	0.06	0.4	0.06	0.4	
	Student	0.4	0.06	0.4	0.06	0.4	
	Recreational	0.6	0.09	0.5	0.09	0.5	

Notes:

a) Exceedances of the significance criteria are in **bold**. The significance thresholds apply to the CEQA and NEPA increments only.

b) The maximum increments might not necessarily occur at the same receptor locations as the maximum impacts. This means that the increments cannot necessarily be determined by simply subtracting the baseline impacts from the alternative impacts.

c) The CEQA increment represents Alternative minus CEQA baseline. The NEPA increment represents Alternative minus NEPA baseline.

d) Data represent the receptor locations with the maximum impacts or increments. The impacts or increments at all other receptors would be less than these values.

e) The cancer risk values reported in this table for the residential receptor are based on the 80th percentile breathing rate.

f) Construction emissions were modeled with the operational emissions for the determination of cancer risk.

g) When the predicted impact is less than zero, the Alternative risk is less than the respective baseline.

6.2.2 Mitigated Impacts

Mitigation is not applied to Alternative 1 (No Project) since there is no discretionary action. Under Alternative 2 (No Federal Action/NEPA Baseline) the limited improvements to the terminal – essentially upgrading/expanding the refrigerated container storage area – do not change the operations from the No Project scenario or expand the other operating areas. The mitigation available and applied, as discussed in Section 3.2 of the EIS/EIR would not change Alternative 2 emissions from the unmitigated condition. Therefore, mitigated impacts are estimated for Alternatives 3 through 6 only.

6.2.2.1 Alternative 3

Mitigated health risk impacts for those Alternative 3 risks that exceeded the significance thresholds when unmitigated are presented in Table 6-15.

Table 6-15. Maximum Incremental CEQA and NEPA Health Impacts Associated with Alternative 3 With Mitigation

Health Impact	Receptor Type	Maximum Predicted Impact[a,d]					Significance Threshold
		Alt 3	Future CEQA Baseline	Future CEQA Increment[b,c]	NEPA Baseline	NEPA Increment[b,c]	
Cancer Risk[f]	Residential[e]	42	22	**20×10^{-6} (20 in a million)**	-[g]	-[g]	10×10^{-6} (10 in a million)
	Occupational	27	18	9×10^{-6} (9 in a million)	-[g]	-[g]	
Acute Hazard Index	Residential	1.0	0.2	0.8	0.2	0.8	1.0
	Occupational	1.3	0.2	**1.1**	0.2	**1.1**	

Notes:

a) Exceedances of the significance criteria are in **bold**. The significance thresholds apply to the CEQA and NEPA increments only.

b) The maximum increments might not necessarily occur at the same receptor locations as the maximum impacts. This means that the increments cannot necessarily be determined by simply subtracting the baseline impacts from the alternative impacts.

c) The CEQA increment represents Alternative minus CEQA baseline. The NEPA increment represents Alternative minus NEPA baseline.

d) Data represent the receptor locations with the maximum impacts or increments. The impacts or increments at all other receptors would be less than these values.

e) The cancer risk values reported in this table for the residential receptor are based on the 80th percentile breathing rate.

f) Construction emissions were modeled with the operational emissions for the determination of cancer risk.

g) Impacts that were less than the significant thresholds were not reanalyzed for mitigation.

6.2.2.2 Alternative 4

Mitigated health risk impacts for those Alternative 4 risks that exceeded the significance thresholds when unmitigated are presented in Table 6-16.

Table 6-16. Maximum Incremental CEQA and NEPA Health Impacts Associated with Alternative 4 With Mitigation

Health Impact	Receptor Type	Maximum Predicted Impact[a,d]					Significance Threshold
		Alt 4	Future CEQA Baseline	Future CEQA Increment[b,c]	NEPA Baseline	NEPA Increment[b,c]	
Cancer Risk[f]	Residential[e]	44	22	**22 x 10^{-6} (22 in a million)**	-[g]	-[g]	10 x 10^{-6} (10 in a million)
	Occupational	28	18	**10 x 10^{-6} (10 in a million)**	-[g]	-[g]	
Acute Hazard Index	Residential	1.0	0.2	0.8	0.2	0.8	1.0
	Occupational	1.3	0.2	**1.1**	0.2	**1.1**	

Notes:

a) Exceedances of the significance criteria are in **bold**. The significance thresholds apply to the CEQA and NEPA increments only.

b) The maximum increments might not necessarily occur at the same receptor locations as the maximum impacts. This means that the increments cannot necessarily be determined by simply subtracting the baseline impacts from the alternative impacts.

c) The CEQA increment represents Alternative minus CEQA baseline. The NEPA increment represents Alternative minus NEPA baseline.

d) Data represent the receptor locations with the maximum impacts or increments. The impacts or increments at all other receptors would be less than these values.

e) The cancer risk values reported in this table for the residential receptor are based on the 80th percentile breathing rate.

f) Construction emissions were modeled with the operational emissions for the determination of cancer risk.

g) Impacts that were less than the significant thresholds were not reanalyzed for mitigation.

6.2.2.3 Alternative 5

Mitigated health risk impacts for those Alternative 5 risks that exceeded the significance thresholds when unmitigated are presented in Table 6-17.

Table 6-17. Maximum Incremental CEQA and NEPA Health Impacts Associated with Alternative 5 With Mitigation

Health Impact	Receptor Type	Maximum Predicted Impact[a,d]					Significance Threshold
		Alt 5	Future CEQA Baseline	Future CEQA Increment[b,c]	NEPA Baseline	NEPA Increment[b,c]	
Cancer Risk[f]	Residential[e]	45	22	**23 x 10^{-6} (23 in a million)**	-[g]	-[g]	10 x 10^{-6} (10 in a million)
	Occupational	29	18	**11 x 10^{-6} (11 in a million)**	-[g]	-[g]	
Acute Hazard Index	Residential	1.1	0.2	0.9	0.2	0.9	1.0
	Occupational	1.3	0.2	**1.1**	0.2	**1.1**	

Notes:

a) Exceedances of the significance criteria are in **bold**. The significance thresholds apply to the CEQA and NEPA increments only.

b) The maximum increments might not necessarily occur at the same receptor locations as the maximum impacts. This means that the increments cannot necessarily be determined by simply subtracting the baseline impacts from the alternative impacts.

c) The CEQA increment represents Alternative minus CEQA baseline. The NEPA increment represents Alternative minus NEPA baseline.

d) Data represent the receptor locations with the maximum impacts or increments. The impacts or increments at all other receptors would be less than these values.

e) The cancer risk values reported in this table for the residential receptor are based on the 80th percentile breathing rate.

f) Construction emissions were modeled with the operational emissions for the determination of cancer risk.

g) Impacts that were less than the significant thresholds were not reanalyzed for mitigation.

6.2.2.4 Alternative 6

Mitigated health risk impacts for those Alternative 6 risks that exceeded the significance thresholds when unmitigated are presented in Table 6-18.

Table 6-18. Maximum Incremental CEQA and NEPA Health Impacts Associated with Alternative 6 With Mitigation

Health Impact	Receptor Type	Maximum Predicted Impact[a,d]					Significance Threshold
		Alt 6	**Future CEQA Baseline**	**Future CEQA Increment[b,c]**	**NEPA Baseline**	**NEPA Increment[b,c]**	
Cancer Risk[f]	Residential[e]	45	22	**23×10^{-6} (23 in a million)**	-[g]	-[g]	10×10^{-6} (10 in a million)
	Occupational	29	18	**11×10^{-6} (11 in a million)**	-[g]	-[g]	
Acute Hazard Index	Residential	1.1	0.2	0.9	0.2	0.9	1.0
	Occupational	1.3	0.2	**1.1**	0.2	**1.1**	

Notes:

a) Exceedances of the significance criteria are in **bold**. The significance thresholds apply to the CEQA and NEPA increments only.

b) The maximum increments might not necessarily occur at the same receptor locations as the maximum impacts. This means that the increments cannot necessarily be determined by simply subtracting the baseline impacts from the alternative impacts.

c) The CEQA increment represents Alternative minus CEQA baseline. The NEPA increment represents Alternative minus NEPA baseline.

d) Data represent the receptor locations with the maximum impacts or increments. The impacts or increments at all other receptors would be less than these values.

e) The cancer risk values reported in this table for the residential receptor are based on the 80th percentile breathing rate.

f) Construction emissions were modeled with the operational emissions for the determination of cancer risk.

g) Impacts that were less than the significant thresholds were not reanalyzed for mitigation.

7.0 Risk Uncertainty

There are a number of factors that contribute to uncertainty in risk calculations. These include but are not limited to the need for estimating previous and current emissions and also projecting future emissions, the use of computer models and representative data to estimate risk at a given location, and uncertainty behind the cancer potency factors and RELs used to gauge the magnitude of adverse health effects that may occur from exposure to TACs.

To provide a margin of safety, this report has been prepared with built-in conservatism where assumptions have been made.

8.0 References

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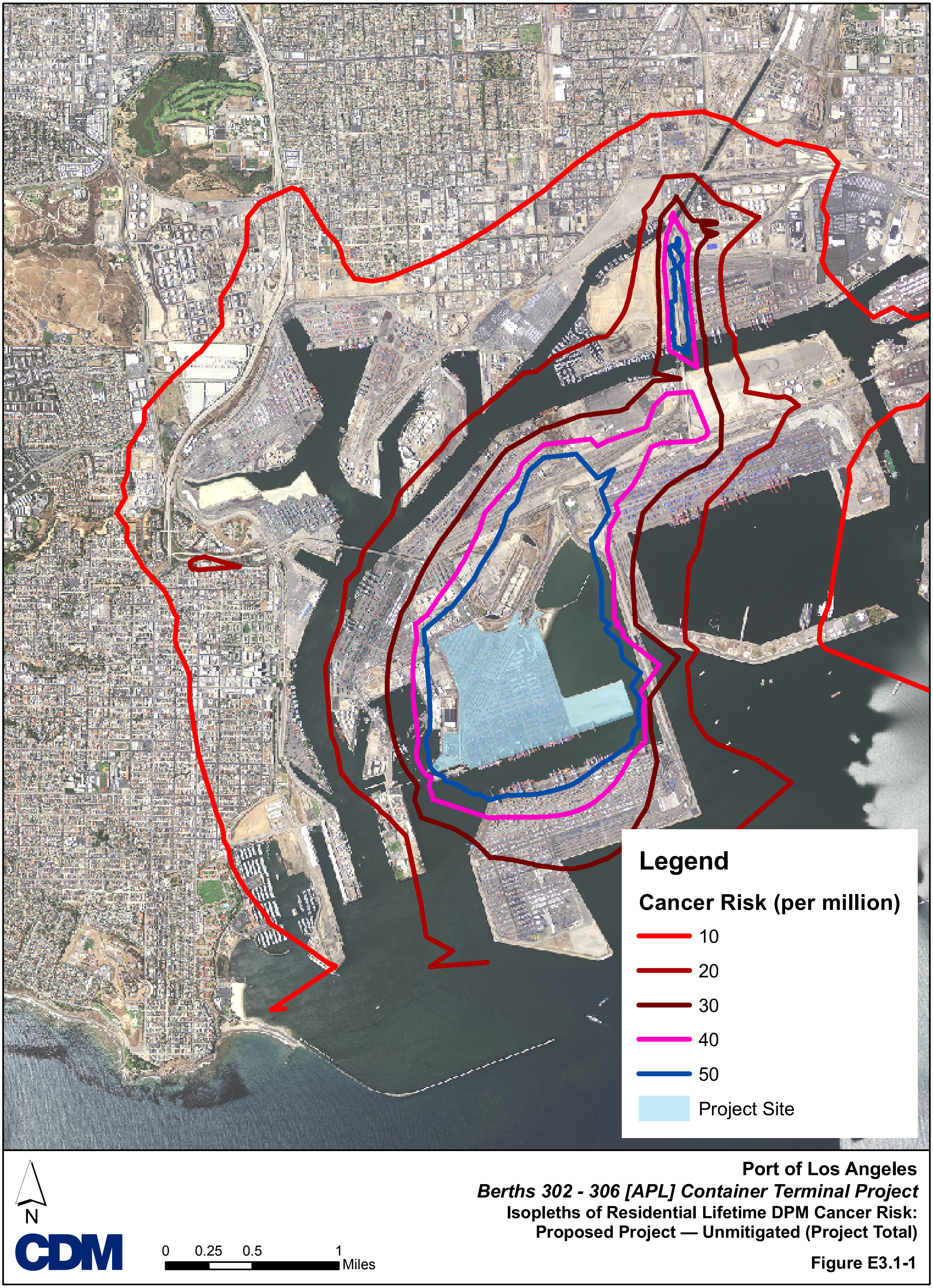
Attachment E3.1

Isopleths of Total Residential Lifetime Cancer Risks due to Exposure to Diesel Particulate Matter for the Proposed Project (without and with mitigation), NOP CEQA Baseline, future CEQA Baseline, and NEPA Baseline



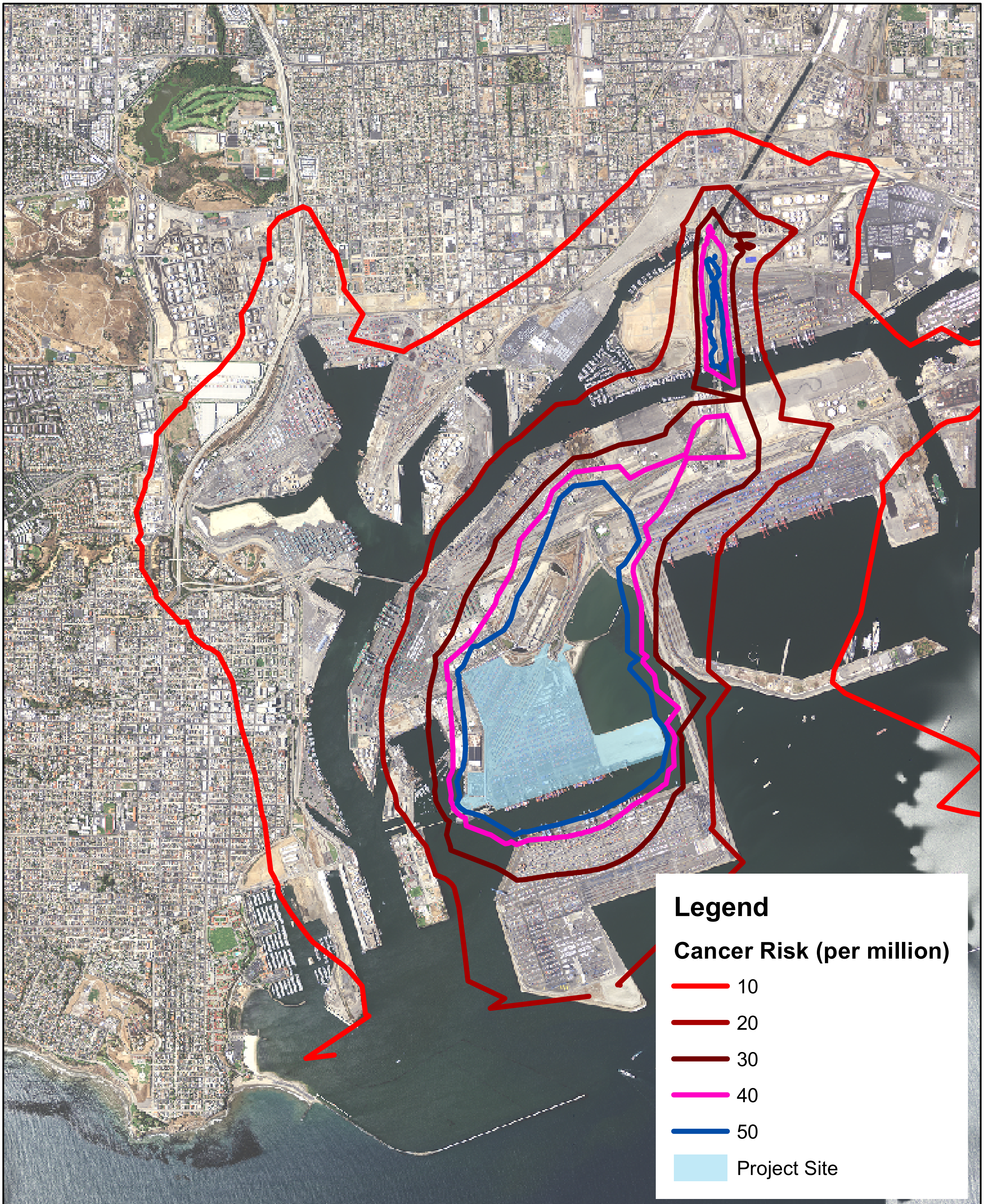
CDM

Port of Los Angeles

Berths 302 - 306 [APL] Container Terminal Project

Isopleths of Residential Lifetime DPM Cancer Risk: Proposed Project — Unmitigated (Project Total)

Figure E3.1-1



N

CDM

0 0.25 0.5 1 Miles

Port of Los Angeles
Berths 302 - 306 [APL] Container Terminal Project
Isopleths of Residential Lifetime DPM Cancer Risk:
Proposed Project — Mitigated (Project Total)

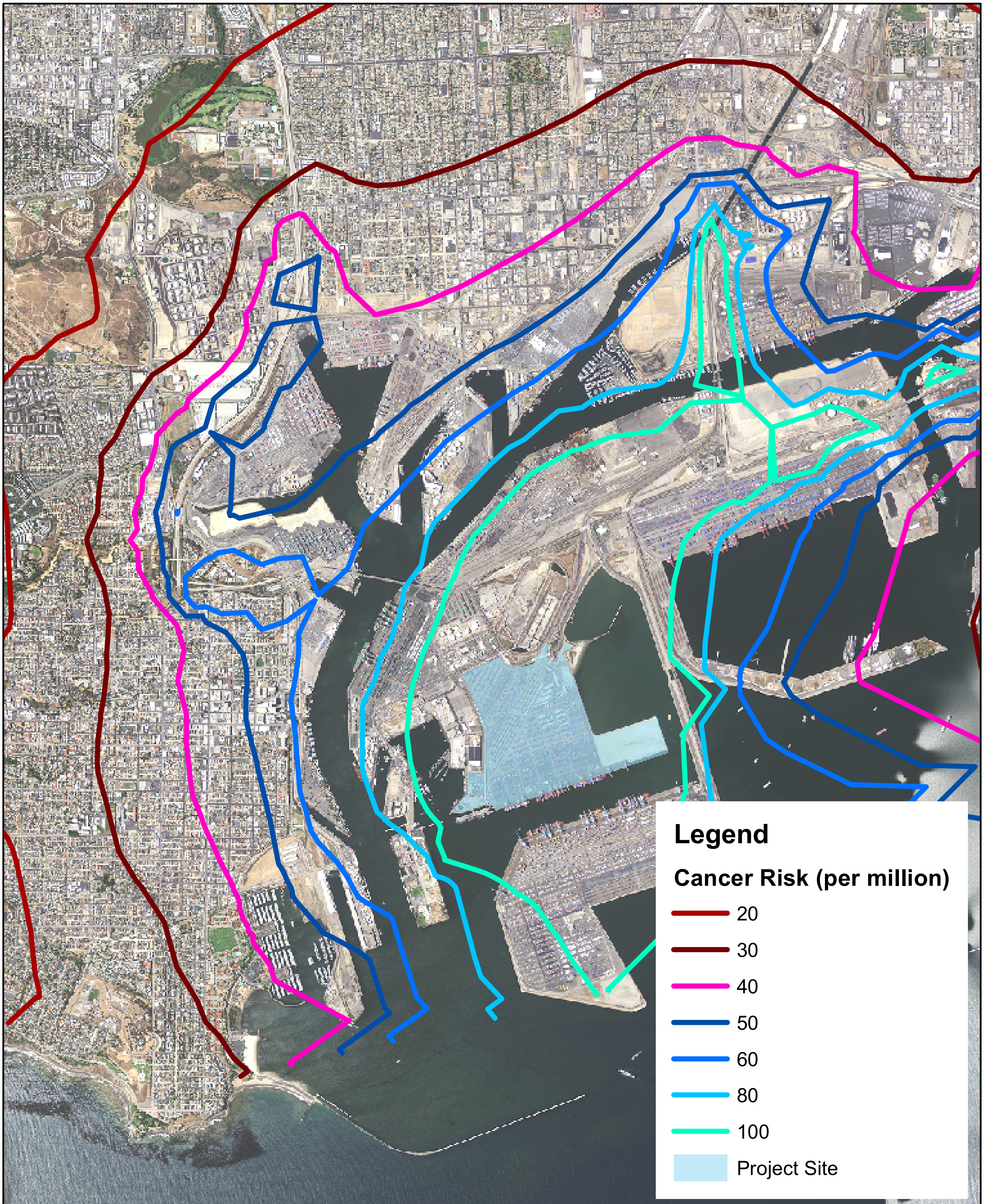
Figure E3.1-2

Port of Los Angeles

Berths 302 - 306 [APL] Container Terminal Project

Isopleths of Residential Lifetime DPM Cancer Risk: NEPA Baseline

Figure E3.1-3



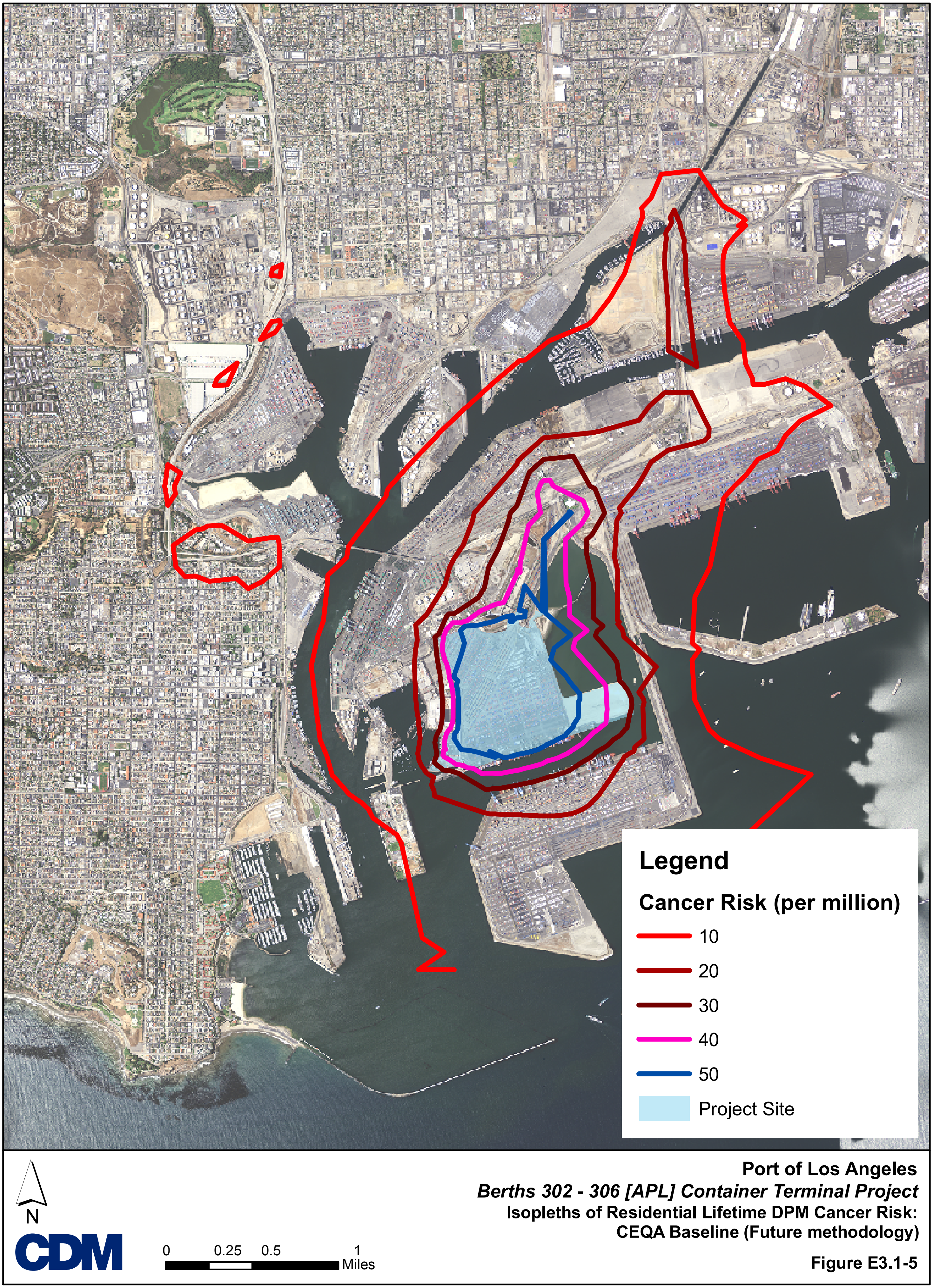
Port of Los Angeles
Berths 302 - 306 [APL] Container Terminal Project
Isopleths of Residential Lifetime DPM Cancer Risk:
CEQA Baseline (NOP methodology)

N

CDM

0 0.25 0.5 1 Miles

Figure E3.1-4

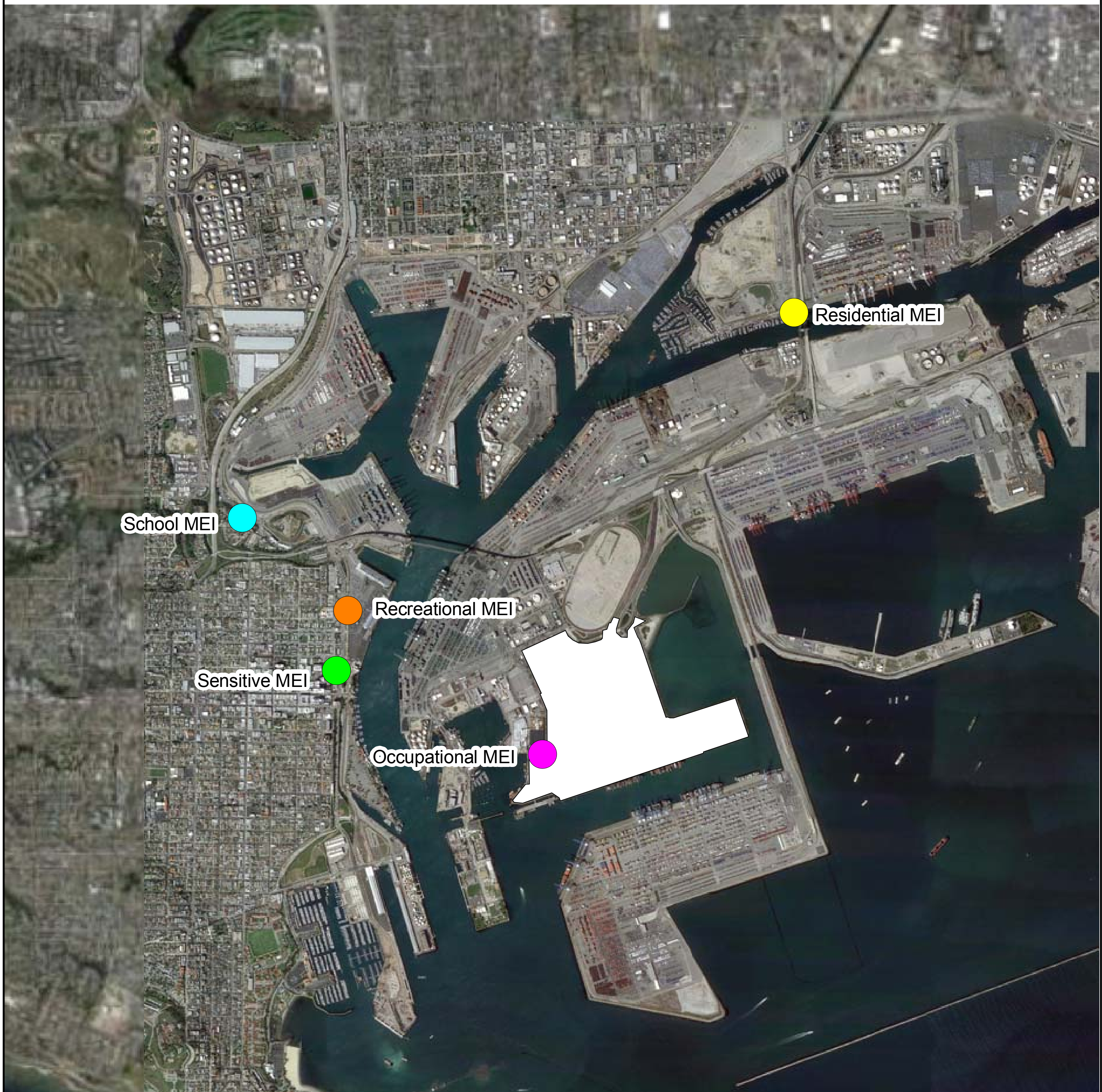


Port of Los Angeles
Berths 302 - 306 [APL] Container Terminal Project
Isopleths of Residential Lifetime DPM Cancer Risk:
CEQA Baseline (Future methodology)

Figure E3.1-5

Attachment E3.2

Maximum Exposed Individual (MEI) Location Maps for Cancer, Chronic Non-Cancer and Acute Incremental Health Risk Impacts



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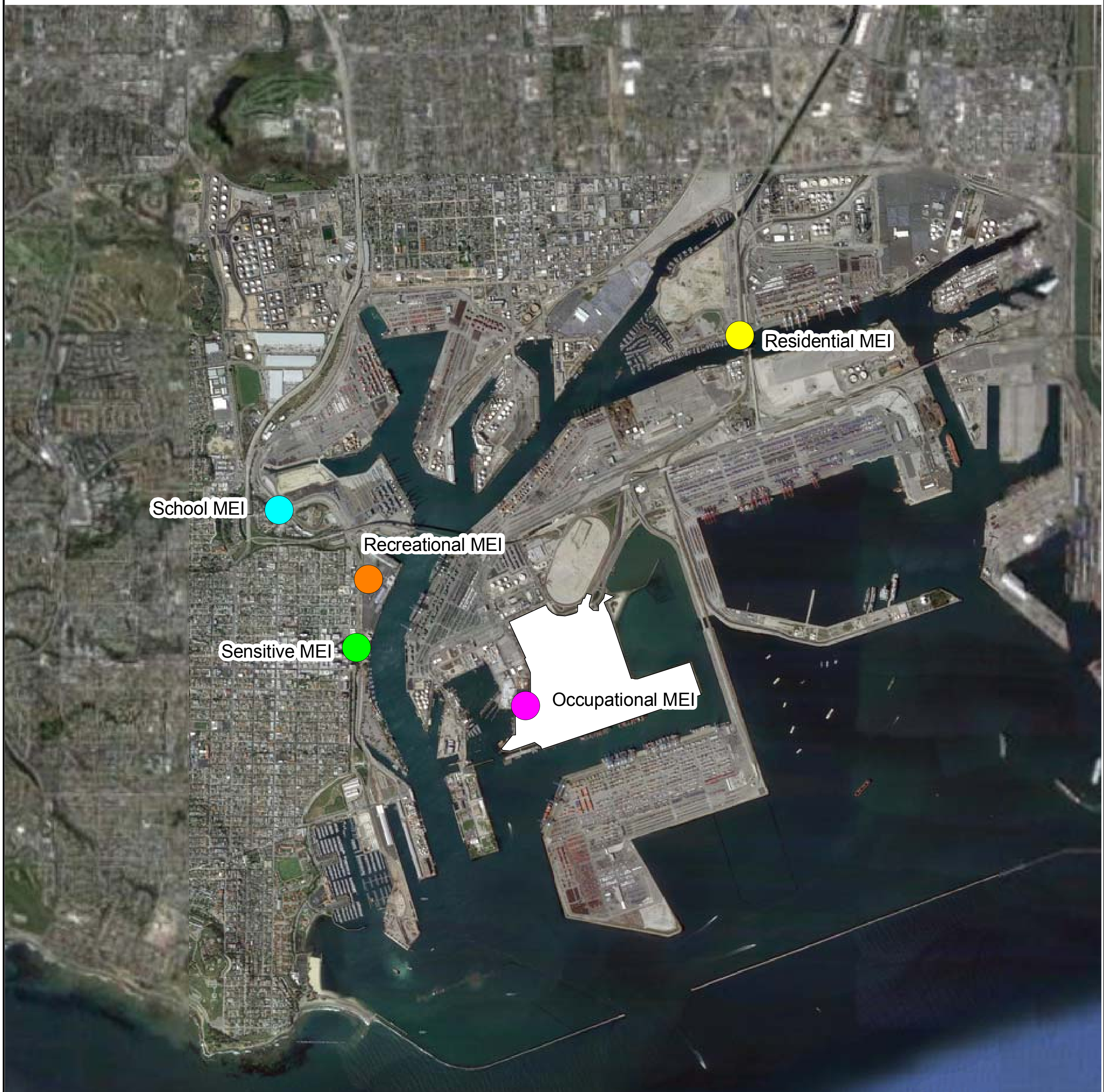
Port of Los Angeles

Berths 302 - 306 [APL] Container Terminal Project

Unmitigated Proposed Project minus NOP CEQA Baseline

Maximum Exposed Individual (MEI) Locations for Cancer Risk

Figure E3.2-1



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CDM

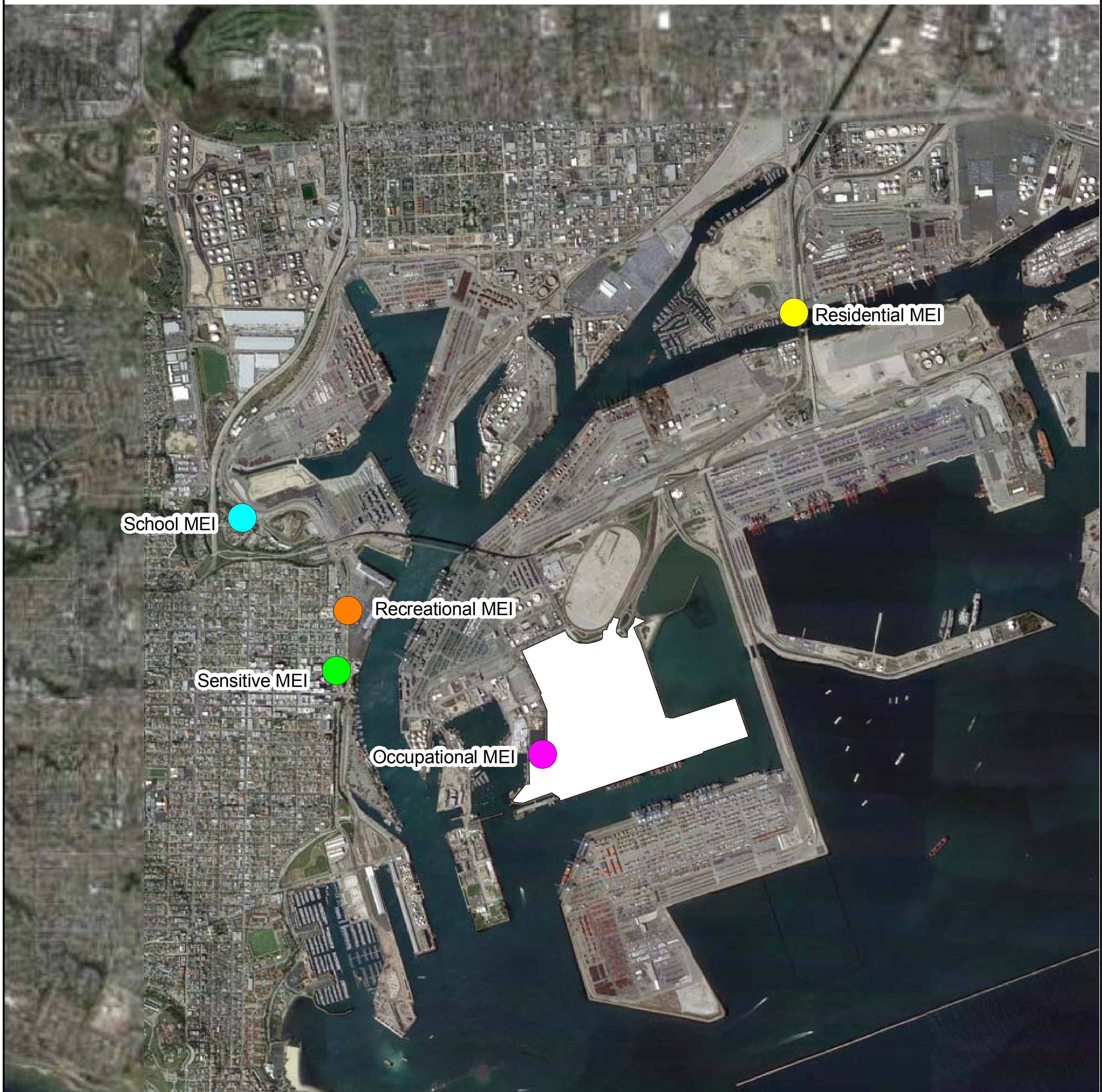
Port of Los Angeles

Berths 302 - 306 [APL] Container Terminal Project

Mitigated Proposed Project minus NOP CEQA Baseline

Maximum Exposed Individual (MEI) Locations for Cancer Risk

Figure E3.2-2



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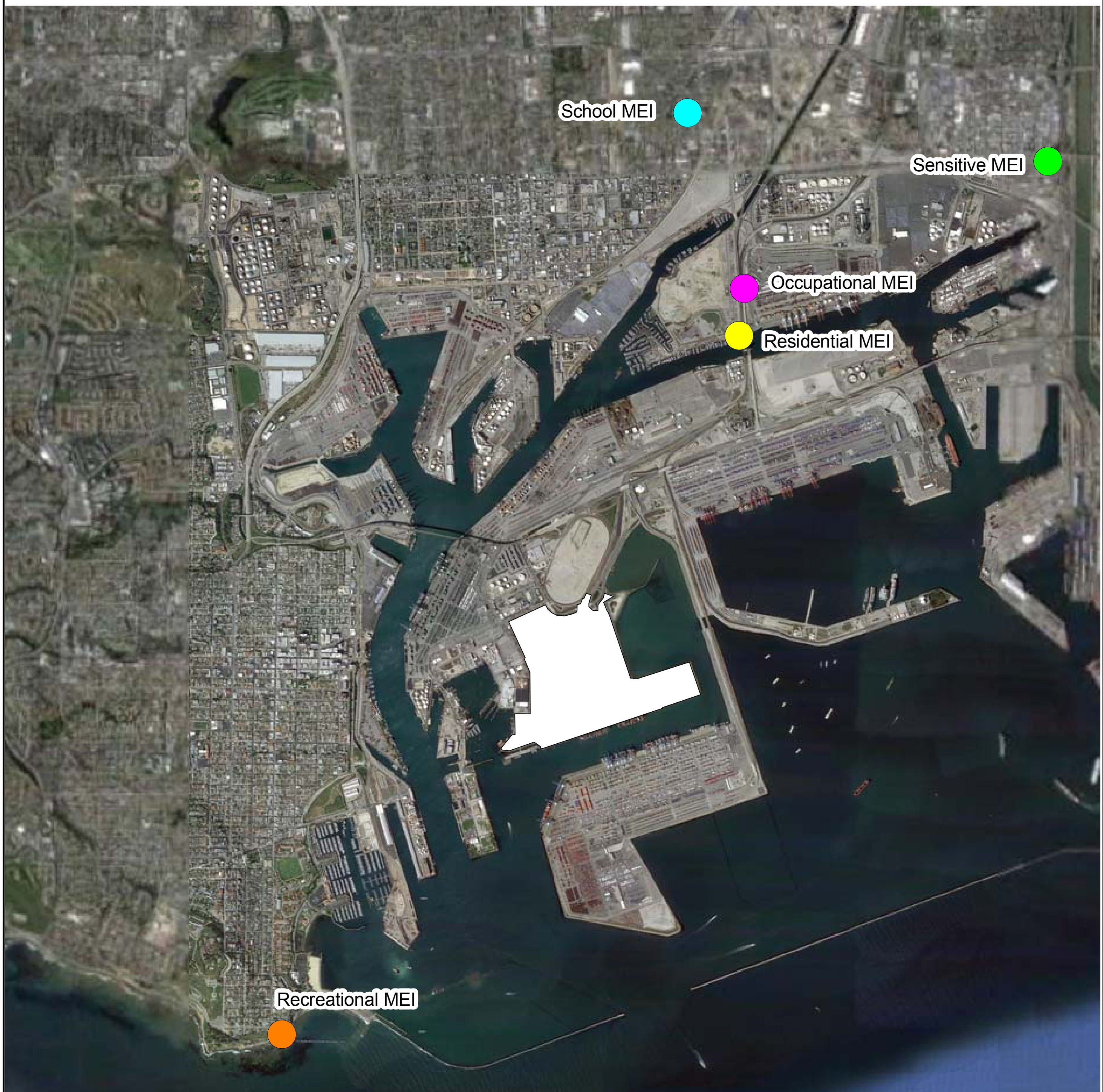
Port of Los Angeles
Berths 302 - 306 [APL] Container Terminal Project
Unmitigated Proposed Project minus NEPA Baseline
Maximum Exposed Individual (MEI) Locations for Cancer Risk

Figure E3.2-3



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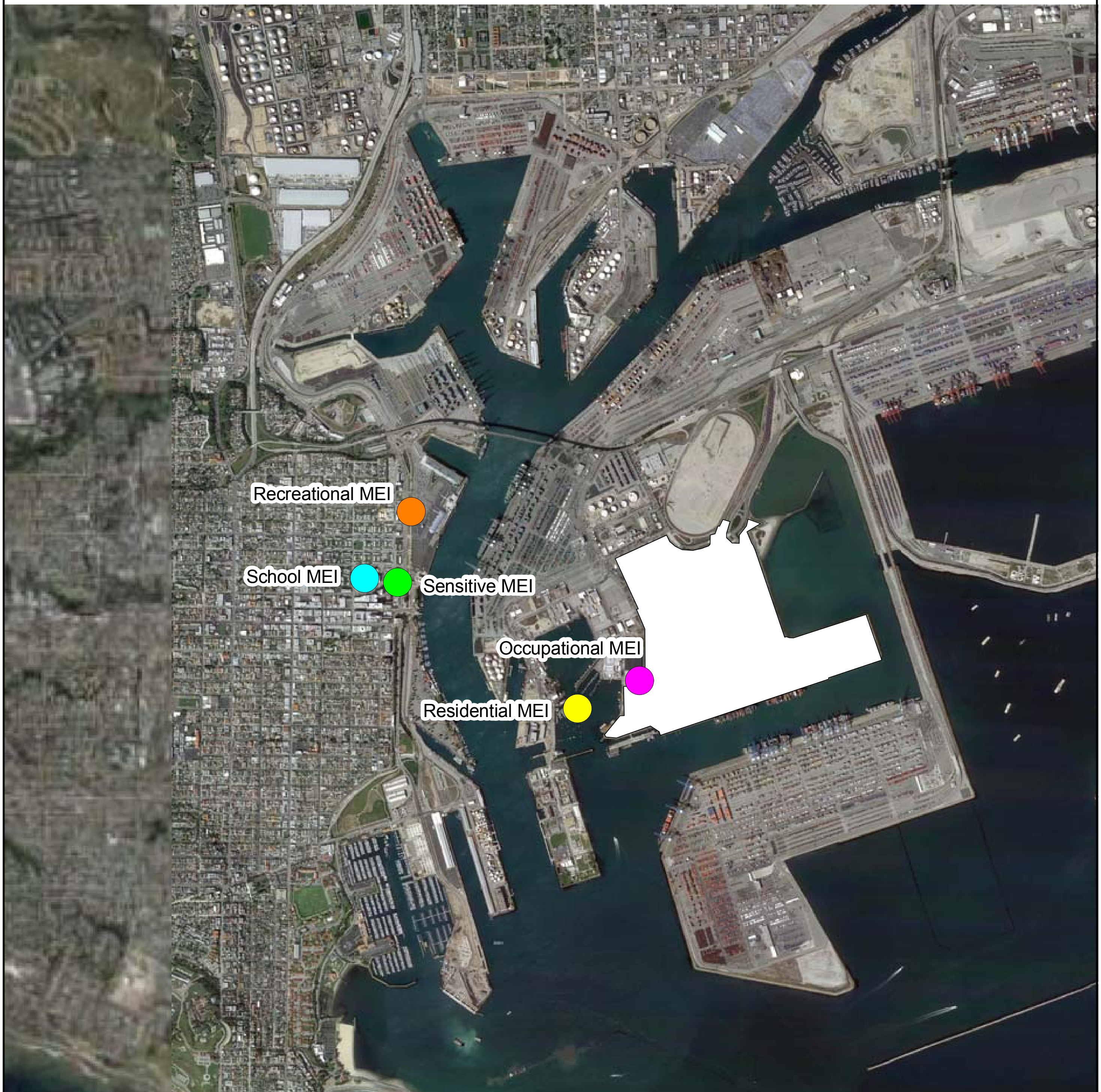
CDM

Port of Los Angeles
Berths 302 - 306 [APL] Container Terminal Project
Mitigated Proposed Project minus NEPA Baseline
Maximum Exposed Individual (MEI) Locations for Cancer Risk

Figure E3.2-4



N

CDM

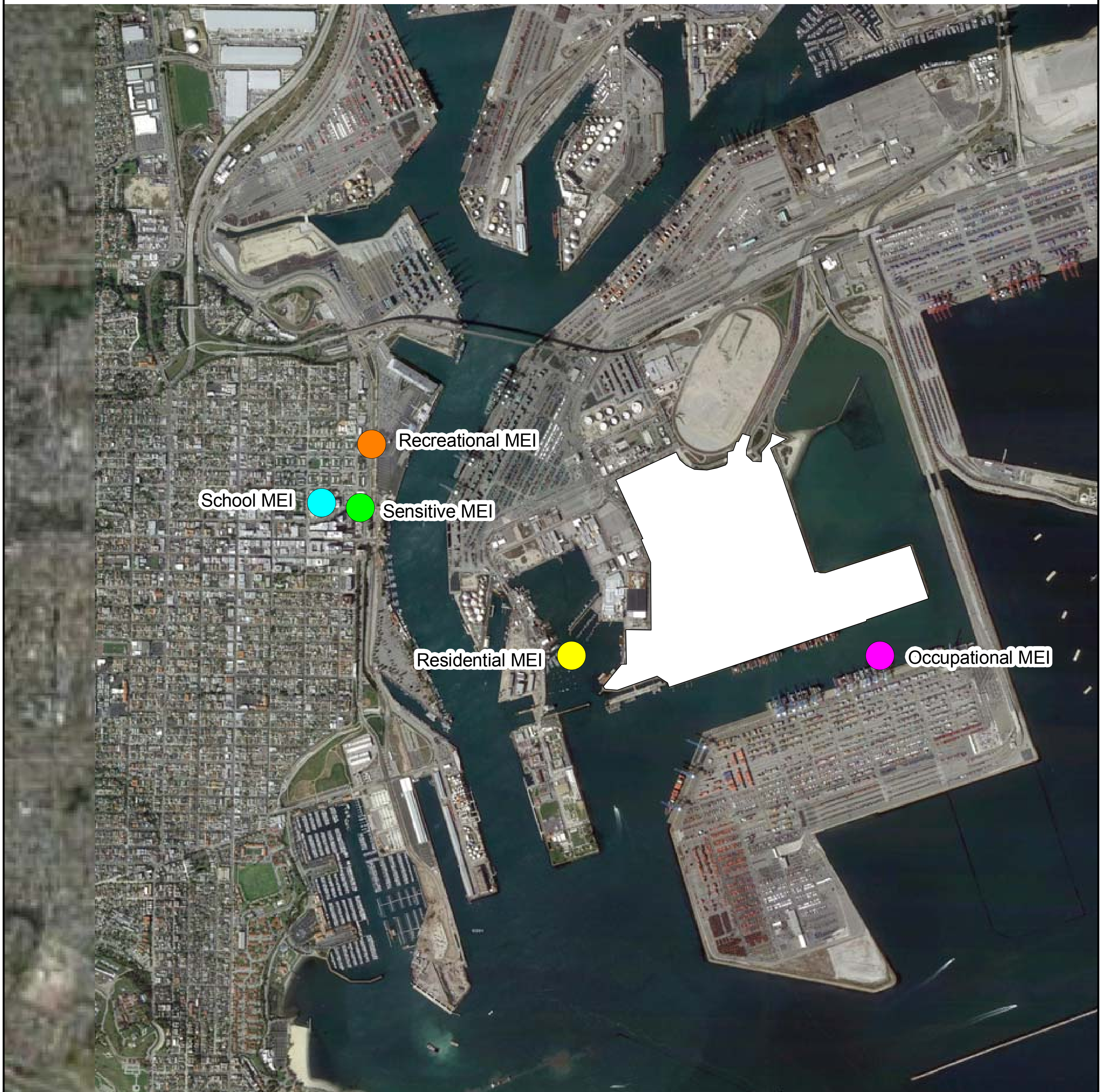
Port of Los Angeles

Berths 302 - 306 [APL] Container Terminal Project

Unmitigated Proposed Project minus NEPA Baseline

Maximum Exposed Individual (MEI) Locations for Chronic Non-Cancer Risk

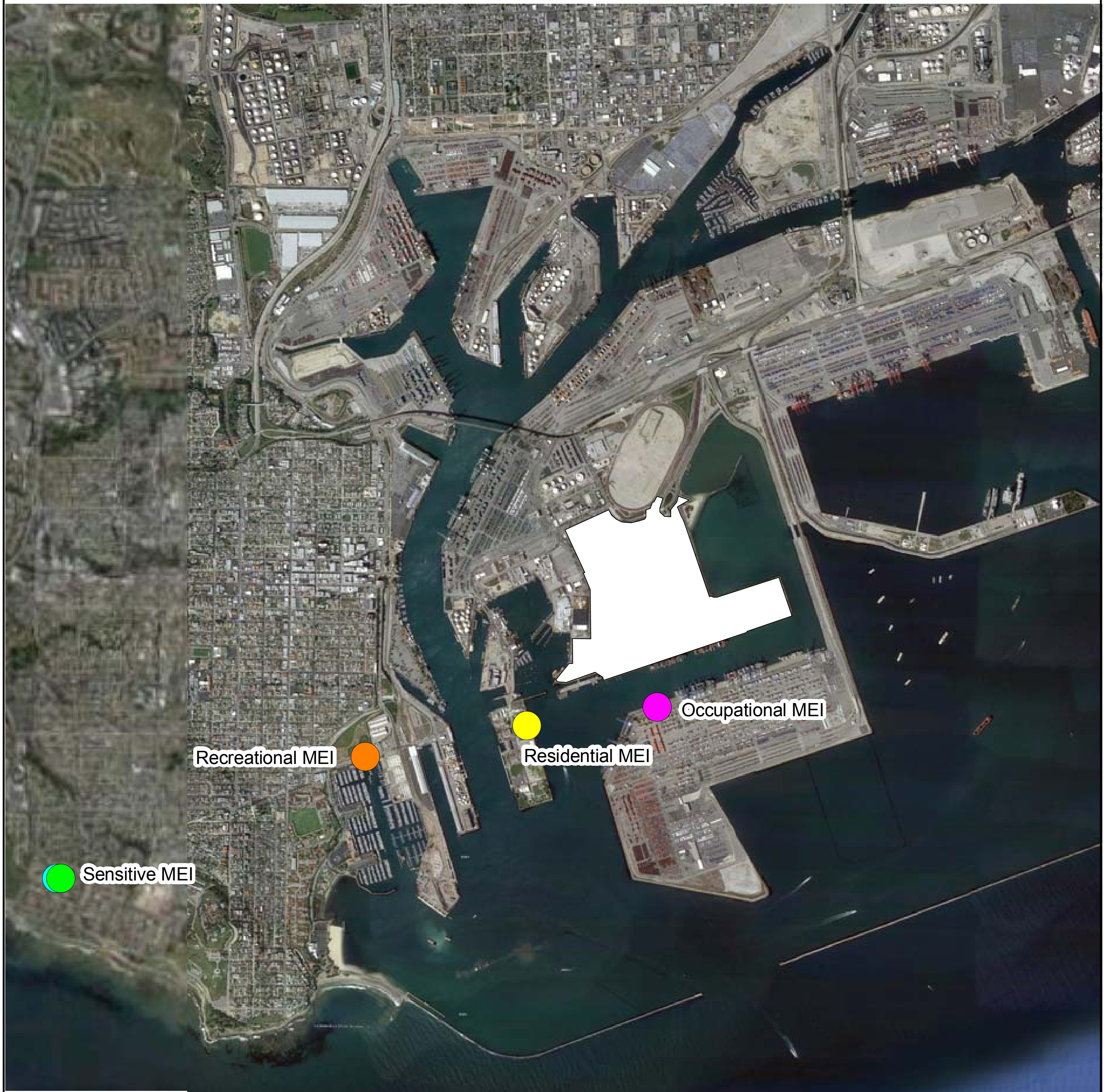
Figure E3.2-5



CDM

Port of Los Angeles
Berths 302 - 306 [APL] Container Terminal Project
Mitigated Proposed Project minus NEPA Baseline
Maximum Exposed Individual (MEI) Locations for Chronic Non-Cancer

Figure E3.2-6



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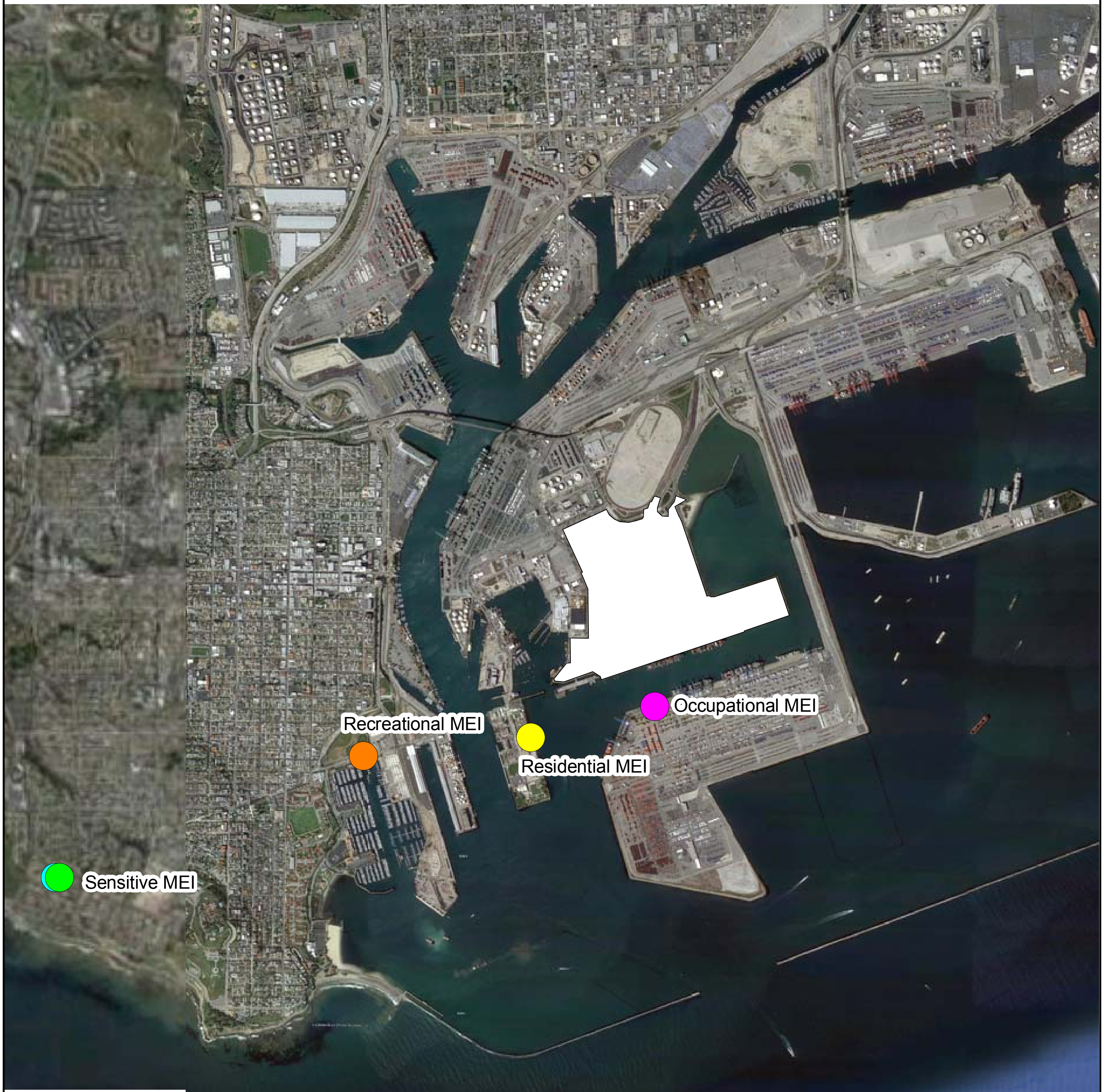
CDM

Port of Los Angeles
Berths 302 - 306 [APL] Container Terminal Project
Unmitigated Proposed Project minus NEPA Baseline
Maximum Exposed Individual (MEI) Locations for Acute Risk

Figure E3.2-7



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CDM

Port of Los Angeles

Berths 302 - 306 [APL] Container Terminal Project

Mitigated Proposed Project minus NEPA Baseline

Maximum Exposed Individual (MEI) Locations for Acute Risk

Figure E3.2-8

Attachment E3.3

Mitigated Proposed Project Incremental Cancer Burden Relative to the Future CEQA Baseline

Port of Los Angeles
Berths 302-306 [APL] Container Terminal Project
HRA Cancer Burden Estimate
Mitigated Proposed Project minus Future CEQA Baseline

Census Tract No.	Total Population	Incremental Cancer Risk per million	Incremental Cancer Burden
2933.01	2,977	1	2.98E-03
2933.02	4,302	1	4.30E-03
2933.04	4,207	1	4.21E-03
2933.05	4,660	1	4.66E-03
2941.10	4,060	2	8.12E-03
2941.20	2,529	2	5.06E-03
2942.00	4,425	2	8.85E-03
2943.00	7,059	2	1.41E-02
2944.10	3,854	1	3.85E-03
2944.20	3,270	1	3.27E-03
2945.10	4,266	2	8.53E-03
2945.20	3,609	3	1.08E-02
2946.10	3,875	3	1.16E-02
2946.20	3,931	3	1.18E-02
2947.00	3,270	5	1.64E-02
2948.10	4,039	3	1.21E-02
2948.20	3,555	3	1.07E-02
2948.30	3,274	4	1.31E-02
2949.00	3,262	5	1.63E-02
2951.01	5,188	2	1.04E-02
2961.00	1,434	10	1.43E-02
2962.10	2,858	4	1.14E-02
2962.20	3,605	4	1.44E-02
2963.00	4,348	2	8.70E-03
2964.00	6,294	1	6.29E-03
2965.00	3,796	3	1.14E-02
2966.00	5,200	3	1.56E-02
2969.00	8,250	3	2.48E-02
2970.00	5,482	1	5.48E-03
2971.10	4,547	3	1.36E-02
2971.20	3,358	3	1.01E-02
2972.00	8,011	2	1.60E-02
2973.00	2,886	1	2.89E-03
2975.00	3,324	2	6.65E-03
2976.00	6,572	2	1.31E-02
5436.02	7,323	1	7.32E-03
5436.03	4,116	1	4.12E-03
5436.04	5,162	1	5.16E-03
5437.01	3,062	1	3.06E-03

Port of Los Angeles
Berths 302-306 [APL] Container Terminal Project
HRA Cancer Burden Estimate
Mitigated Proposed Project minus Future CEQA Baseline

Census Tract No.	Total Population	Incremental Cancer Risk per million	Incremental Cancer Burden
5437.02	6,354	1	6.35E-03
5437.03	3,671	2	7.34E-03
5439.03	3,786	1	3.79E-03
5439.04	4,426	1	4.43E-03
5440.00	7,625	1	7.63E-03
5721.00	1,083	1	1.08E-03
5722.01	6,457	1	6.46E-03
5722.02	3,713	1	3.71E-03
5723.02	3,502	1	3.50E-03
5724.00	1,073	1	1.07E-03
5725.00	3,700	1	3.70E-03
5726.00	5,130	1	5.13E-03
5727.00	5,495	1	5.50E-03
5728.00	263	2	5.26E-04
5729.00	3,310	2	6.62E-03
5730.01	7,108	1	7.11E-03
5731.00	7,291	1	7.29E-03
5754.01	5,476	2	1.10E-02
5754.02	3,758	1	3.76E-03
5755.00	252	2	5.04E-04
5756.00	46	10	4.60E-04
5758.01	2,721	2	5.44E-03
5758.02	5,433	1	5.43E-03
5758.03	2,968	1	2.97E-03
5759.01	3,825	2	7.65E-03
5759.02	5,108	1	5.11E-03
5760.00	445	2	8.90E-04
6099.00	1,678	1	1.68E-03
6700.01	3,244	1	3.24E-03
6700.02	3,773	1	3.77E-03
6701.00	6,484	1	6.48E-03
6702.01	3,889	1	3.89E-03
6707.01	6,777	1	6.78E-03
	299,913		5.26E-01
Source: U.S. Census Bureau, 2000.			**0.53**