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VOLUME II APPENDICES

A	Air Quality Technical Report (Ramboll Environ US Corporation [September 2016])
B	Noise Quality Technical Report (Ramboll Environ US Corporation [October 3, 2016])
C	Transportation Technical Report for Draft EIS (Heffron Transportation, Inc. October 6, 2016)
D	Stormwater Technical Memorandum for EIS (Aspect Consulting [May 6, 2016])
E	Biological Assessment Terminal 5 Cargo Wharf Rehabilitation and Berth Deepening (Hart Crowser, Inc. [May 6, 2016])
F	Rail Infrastructure and Train Volume Analysis Memorandum for Terminal 5 (Moffatt & Nichol [April 22, 2016])
G	Vessel Traffic and Navigation Memorandum for Terminal 5 (Moffatt & Nichol [April 20, 2016])
H	Water Quality Monitoring Report (Hart Crowser, Inc. [May 12, 2016])
I	Sea Level Rise Considerations for Terminal 5 (Moffatt & Nichol [April 20, 2016])
J	95% Geotechnical Engineering Design Study for Terminal 5 Cargo Wharf Rehabilitation and Berth Deepening (Hart Crowser, Inc. [June 14, 2016])
K	Draft Southwest Harbor Terminal 5 Cargo Groundwater Quality Monitoring Evaluation Report, Seattle, Washington (Hart Crowser, Inc. [July 8, 2014])
L	Shoreline Master Program Development Standards Compliance Terminal 5 Cargo Wharf Rehabilitation and Berth Deepening Project (DPD Project No. 3019071) (Anchor QEA, LLC. [December 2015])
M	Operational Noise Management Plan (Ramboll Environ US Corporation [October 1, 2016])

## ACRONYMS AND ABBREVIATIONS

Abbreviation	Term
<u>CHEMICAL ELEMENTS AND COMPOUNDS</u>	
CH <sub>4</sub>	methane
CO	carbon monoxide
CO <sub>2</sub>	carbon dioxide
CO <sub>2</sub> e	carbon dioxide equivalent
cPAH	carcinogenic polycyclic aromatic hydrocarbons
DO	dissolved oxygen
GHG	greenhouse gas
NO <sub>x</sub>	nitrogen oxide
NO <sub>2</sub>	nitrogen dioxide
O <sub>3</sub>	ozone
PM <sub>2.5</sub>	fine particulate matter
PM <sub>10</sub>	inhalable particulate matter
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
SO <sub>x</sub>	sulfur oxide
SO <sub>2</sub>	sulfur dioxide

### UNITS OF MEASURE

μg/m <sup>3</sup>	micrograms per cubic meter
μPa	micropascal
amp	ampere
cy	cubic yard(s)
dB	decibel(s)
dBA	A-weighted decibel(s)
ESU	engineering soil unit

Abbreviation	Term
g	grams
km	kilometer
kV	kilovolt
kW	kilowatt
Ldn	Day-night sound level
Leq	equivalent sound level
Lmax	maximum sound level
m	meter
mg/L	milligrams per liter
MTCO <sub>2e</sub>	million metric tons of carbon dioxide equivalent
MVA	megavolt ampere
MW	megawatts
ng/kg	nanograms per kilogram
NTU	nephelometric turbidity units
ppb	parts per billion
ppm	parts per million
ppt	parts per thousand
pptr	parts per trillion
TEU	twenty-foot equivalent unit
tpy	tons per year

GENERAL ACRONYMS/ABBREVIATIONS

AESS	automatic engine shutoff system
ASIL	Acceptable Source Impact Level
AWDT	Average Weekday Daily Traffic
bgs	below ground surface
BINMIC	Ballard/Interbay Northend Manufacturing Industrial Center
BMP	best management practice
Caltrans	California Department of Transportation



Abbreviation	Term
CEM	the CEM property
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CHE	container handling equipment
Comprehensive Plan	City of Seattle comprehensive Plan
CMP	Construction Management Plan
CPPs	King County Countywide Planning Policies
CWA	Clean Water Act
DAHP	Department of Archaeology and Historic Preservation
DCI	Department of Construction and Inspections
DEIS	Draft Environmental Impact Statement
DMMO	Dredged Material Management Office
DMMP	Dredged Material Management Program
DNR	Washington State Department of Natural Resources
DNS	Determination of Nonsignificance
DPM	diesel engine exhaust particulate matter
ECA	environmentally critical area
Ecology	Washington State Department of Ecology
EFH	essential fish habitat
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
EW	East Waterway
FAP	Freight Access Project
FEIS	Final Environmental Impact Statement
FHWA	Federal Highway Administration
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
GMA	Growth Management Act

Abbreviation	Term
HPA	Hydraulic Project Approval
IBC	International Building Code
IG1	General Industrial 1
IMO	International Maritime Organization
ISGP	Industrial Stormwater General Permit
ITS	Intelligent Transportation System
LAAS	Larson Anthropological and Archaeological Services
LED	light-emitting diode
LEP	light-emitting plasma
LFOL	Longfellow Creek Overflow Line
LOS	level of service
MHHW	mean higher high water
MIC	Manufacturing Industrial Center
MLLW	mean lower low water
MMPA	Marine Mammal Protection Act
MTCA	Washington State Model Toxics Control Act
MTO	Marine Terminal Operator
NAAQS	National Ambient Air Quality Standard
NDZ	No Discharge Zone
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NWSA	Northwest Seaport Alliance
OLM	Ozone Limiting Method
OSC	Ocean Shipping Consultants
PHS	Priority Habitats and Species

Abbreviation	Term
PIANC	Permanent International Association of Navigational Congresses
PMA	Port Management Agreement
Port	Port of Seattle
POSPD	Port of Seattle Police Department
Project	Terminal 5 Cargo Wharf Rehabilitation, Berth Deepening, and Improvements Project (also referred to as the Project)
PSCAA	Puget Sound Clean Air Agency
PSE	Puget Sound Energy
PSLM	Practical Spreading loss model
PSRC	Pacific Sound Regional Council
RA	Remediation Area
RCW	Revised Code of Washington
RLT	rapid load test
RMG	rail-mounted gantry (crane)
rms	root mean square
RTG	rubber-tired gantry (crane)
SCC	Source Category Code
SCL	Seattle City Light
SDOT	Seattle Department of Transportation
SEL	sound exposure level
SEPA	State Environmental Policy Act
SFD	Seattle Fire Department
SIG	Seattle International Gateway
SLM	Sound Level Measurement
SMA	Shoreline Management Act
SMC	Seattle Municipal Code
SMP	Shoreline Master Program
SoundEarth	SoundEarth Strategies, Inc.
SPCC	Spill Prevention, Control, and

Abbreviation	Term
	Countermeasure
SPL	sound pressure levels
SPU	Seattle Public Utilities
SQS	Sediment Quality Standards
ST3	Sound Transit 3
STS	ship-to-shore
SWPPP	Stormwater Pollution Prevention Plan
TAP	toxic air pollutant
TEQ	toxicity equivalent
TMP	Transportation Management Plan
TP	top-pick
TSP	total suspended particulate
UG	Urban General
UGA	urban growth area
UI	Urban Industrial
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish & Wildlife Service
V/C	volume-to-capacity ratio
VTS	Vessel Traffic Service
WA	Washington
WAC	Washington Administrative Code
WDFW	Washington Department of Fish & Wildlife
WPPA	Washington Public Ports Association
WSDOT	Washington State Department of Transportation
WSY	West Seattle Yard

## TERMINOLOGY

**AKART:** all-known, available and reasonable methods of prevention, control and treatment. AKART represents the most current methodology that can be reasonably required for preventing, controlling, or abating the pollutants associated with a discharge. AKART applied to both point and nonpoint sources of pollution.

**Benthic:** the lowest level of a body of water.

**CAIT Database:** an online database maintained by the World Resources Institute of overall estimated global greenhouse gas emissions.

**Comprehensive Plan:** generalized coordinated land use policy statement of the governing body of a county or city that is adopted pursuant to Chapter 36.70A RCW.

**Consist:** a railroad term used to describe the makeup of a train (i.e., freight, car types, etc.).

**Container:** the box used to transport goods by several modes, including truck, rail, and ship. Containers come in a range of sizes from 20-foot long to 48-foot long. The most common containers are 40-foot long.

**Cut:** a railroad term which describes a grouping of cars coupled together.

**Dray:** the movement of cargo by truck. In the Port of Seattle area, a “dray trip” generally refers to the short truck trip between a marine terminal and an off-site intermodal rail terminal, via public right-of-way. Containers that are moved by truck to local or regional businesses are simply referred to as truck trips.

**Force main:** a sewer main that moves wastewater under pressure using pumps or compressors located in lift stations. Force mains are utilized when gravity flow is insufficient to move water.

**GMA:** Growth Management Act. Adopted in 1990 under the Revised Code of Washington Chapter 36.70A. The GMA provides a comprehensive framework for managing growth, and coordinating land use planning with infrastructure.

**Greater Duwamish Manufacturing/Industrial Center:** center of regional industry located on the northern end of an industrial corridor that extends from downtown Seattle to the Kent Valley. The Greater Duwamish Manufacturing/Industrial Center is comprised of approximately 5,000 acres of marine and industrial land.

**Intermodal:** a transfer of cargo from one mode to another. In the shipping business, an “intermodal container” generally refers to one that will be transported from or to a ship by rail. Terminal 5 has an on-dock intermodal rail yard that allows the direct transfer of containers between rail and ship using yard equipment. However, it is expected that some containers will be trucked (see “dray” below) between the marine terminal and the near-dock rail yards operated by the BNSF Railway and Union Pacific (UP) Railroad.

**MARPOL:** The International Convention for the Prevention of Marine Pollution from Ships, which sets limits on emissions from ship exhausts and prohibits deliberate emissions of ozone depleting substances. MARPOL regulations also apply to potential discharges of petroleum materials, bilge/ballast water discharges, and release of solid waste.

**MICs:** Manufacturing Industrial Centers. Manufacturing Industrial Centers are envisioned as areas of concentrated employment, including manufacturing, industrial and advanced technology. Their purpose is to preserve and encourage the aggregation of land suitable for manufacturing/industrial uses, and discourage non-compatible uses.

**OCR:** optical character recognition. OCR portals are positions at terminal entry and exit points to automatically read identification numbers on trucks and containers.

**Panamax/Super post-Panamax:** Panamax-class ships are limited by the size of the original Panama Canal, and are capable of carrying approximately 4,500 TEUs. The existing berth and cranes at Terminal 5 can accommodate Panamax-class vessels as well as post-Panamax vessels up to approximately 6,000 to 7,000 TEUs, depending on vessel and tide conditions. Super post-Panamax vessels are capable of carrying 10,000 to 18,000 TEUs.

**Pile:** a structural column which is driven into the ground in order to support a vertical load.

**RFID:** radio frequency identification. These devices are used to track truck and container movements through the terminal gates.

**Riparian:** land directly adjacent to rivers, streams or other bodies of water.

**Riprap:** rock placed on shorelines in order to prevent water driven erosion.

**RMG crane:** rail-mounted gantry crane. The largest type of equipment used to lift and stack containers. They are guided by fixed rails, and although not as mobile as top-picks or RTGs, allow for more efficient use of container marshalling yard area, including densely stacked containers, increasing facility capacity.

**RTG crane:** rubber-tired gantry crane. Yard equipment used to lift and stack containers in container marshalling yard areas, increasing facility and capacity. They will typically span over trucks, railcars, and container stacks.

**Seattle SMP:** Seattle Shoreline Master Program. The SMP is mandated by the state Shoreline Management Act and includes the goals, policies, and regulations that govern land use and activities within the Seattle Shoreline District. The Seattle Shoreline District includes: the Duwamish River, the Ship Canal, Lake Union, Lake Washington, Green Lake, and Puget Sound; their associated wetlands and floodplains; and all land within 200 feet of these water bodies.

**Ship-to-shore crane:** a large dockside gantry crane used for loading and unloading intermodal containers from container ships.

**TEU:** twenty-foot equivalent unit. A unit of measure used in the shipping industry. A 40-foot container equals two TEUs. In recent years, Port of Seattle shipments have averaged 1.74 TEUs per container.

**Throughput:** volume of container cargo that passes through a terminal, generally measured in TEUs per year.

**Top-Pick:** yard equipment that is used to lift containers off or onto a truck or rail car, and also used to stack containers in the yard.

**Treaty Fishing Access:** Elliott Bay, the East and West Waterways, and the Duwamish Waterway are recognized as Treaty fishing access areas managed by the Muckleshoot Tribe and the Suquamish Tribe. These areas are Treaty-protected fishing areas.

**Turbid:** in relation to water: the state of being cloudy with suspended sediment.

**TWIC:** Transportation Worker Identification Card, which is issued by the U.S. Department of Homeland Security, and is required to access Terminal 5.

**Weir:** a barrier constructed across a flowing body of water in order to alter its flow.

**West Waterway:** western navigational access channel to the Lower Duwamish Waterway.